DOCUMENT RESUME

ED 045 161 LI 002 379

AUTHOR Maier, Joan M.; And Others
TITLE The Bibliographical Center for Research, Rocky Mountain Regions, Inc.: A Cost Study of the Center's Present Operations.
INSTITUTION Bibliographical Center for Research - Rocky Mountain Region, Inc., Denver, Colo.
PUB DATE 69
NOTE 89p.

EDRS PRICE EDRS Price MF-$0.50 HC-$4.55
DESCRIPTORS *Cost Effectiveness, Estimated Costs, *Information Centers, *Information Networks, Library Surveys, Operating Expenses, Regional Libraries, Systems Analysis, *Unit Costs

ABSTRACT

This cost study analyzes the operating costs of the Bibliographical Center so that the Center can adopt the best possible combination of procedures with which to achieve its service objectives at the lowest possible cost to its members. This study provides data, upon which a fee schedule can be based, that is derived from the form of the input and output in request handling and the type and degree of service required per request. Major recommendations include: (1) streamline the manual system; (2) reassign tasks; (3) establish and levy a revised fee schedule and make a firm agreement on card contributions and input control with each member library; (4) mechanize administrative record keeping; (5) change the structure of the Board; (6) budget for research and development; (7) assign priorities and a schedule to whatever recommendations are adopted with specific authorization to the Director to hire or contract for services to implement these recommendations and (8) identify and mount programs to meet the needs of new areas of service such as the control of media resources in all types of libraries in the region. (MF)

ED0 45161

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY

THE BIBLIOGRAPHICAL CENTER FOR RESEARCH, ROCKY MOUNTAIN REGION: A COST STUDY OF THE CENTER'S PRESENT OPERATIONS

ERIC/CLIS
DEC 16 '69
UNIVERSITY OF MINNESOTA

Prepared by
Joan M. Maier, Project Leader and Consultant and a Project Team
from the Institute on Library System Design & Analysis,
Graduate School of Librarianship, University of Denver

LI 002379

BIBLIOGRAPHICAL CENTER FOR RESEARCH
Rocky Mountain Region, Inc.
Denver, Colorado • 1969

Mr. Donald K. Nelson, President
Bibliographical Center for Research
Rocky Mountain Region, Inc.
1357 Broadway
Denver, Colorado

Dear Mr. Nelson:

As per our contract agreement, I am submitting "A Cost Study of the Center's Operations" completed August 29, 1969. It is my hope that this report conjoined with the user survey report of Miss Genevieve Casey will provide the source material that the Board needs at this time to make decisions affecting the future of the Bibliographical Center. Flow process charts and other products of the cost study too bulky for inclusion in the report are archived at the Bibliographical Center.

Respectfully yours,

Joan M. Maier

Joan M. Maier

TABLE OF CONTENTS

Preface 1

Methodology 4

Operating Costs 9

Recommendations:

Operational Efficiency 12

General Recommendations 19

Summary of Recommendations 24

Appendices:

A. Charts and Tables 26

B. Data Collection Forms 61

C. Background Data 71

APPENDICES

A. Charts and Tables

Charts

I. Proposed Organization Chart 26

II. Present Searching Method 27

III. Proposed Searching Method 33

Tables

I. Labor: Unit Cost Calculation for Bibliographical Center Activities 36

II. Labor: Unit Cost Calculation for Bibliographical Center Activities - (Without the Frequency Percentages) 40

III. Frequency Calculations on Activities 44

IV. Frequency Data (Drawn from Sample of 1968 Requests) 48

V. Frequency Data by Form of Output, 1968 Requests 49

VI. Categories of Referral, 1968 Requests 50

VII. Permanent Employees 1968 52

VIII. Transportation 57

IX. Unit Costs 58

APPENDICES

B. Data Collection Forms

I. Sample Data Collection Sheet 63

II. Bibliographical Center Input 1968 64

APPENDICES

C. Background Data

I. Bibliographical Center Study Guide Line 72

II. Bibliographical Center Primary Objectives 74

III. Present Organization Chart 75

IV. Bibliographical Center Organization Chart (Personnel Assignments) 76

V. Bibliographical Center Operations Outline 77

VI. Floor Plan 78

VII. Audit Statement of Cash Receipts & Disbursements, 1968 79

VIII. Forms Inventory 80

IX. Files Maintained 83

X. Size of Card Catalog Files 85

XI. Furniture and Fixtures Inventory 86

XII. Requests: 1968 Statistics 88

PREFACE

The purpose of this report is to analyze the operating costs of the Bibliographical Center so that the Center can adopt the best possible combination of procedures with which to achieve its service objectives at the lowest possible cost to its members. This report provides data, upon which a fee schedule can be based, that is derived from the form of the input and output in request handling and the type and degree of service required per request. Archived as part of the data collection are time observation sheets, flow process charts, flow decision charts for searching and request processing, and an inventory of forms and files maintained, and various financial and statistical reports. Copies of these documents can be obtained from the Center should the reader of this report require information in greater specificity than the discussion affords. The flow process charts and forms are primary data for the compilation of a comprehensive procedure manual.

The data collection for this report actually began in May 1969. However, the most significant single portion of data, the operations, was collected during the week of July 28 by a team of five professional librarians who were enrolled in the Institute on Library System Design and Analysis. The University of Denver Graduate School of Librarianship held this Institute from July 20 to August 10, 1969, with funding from the U. S. Office of Education. According to the grant proposal, the purpose of the Institute was "to teach the principles of library systems analysis and design to librarians who are now or who soon will be engaged in systems studies in their own libraries." The applicants were to possess not less than three years experience and to be employed in middle management positions.

The faculty of the Institute included Richard Dougherty, Alan Veaner, Henry Voos, and seven resource people from the local area who served as study team leaders for the field analysis assignments during the second week of the Institute. Investigator Joan Maier (Coordinator of the Colorado Academic Libraries Book Processing Center), and five students began their systems analysis July 28. Members of the study team were:

Miss Anna R. Condit
Library Systems Specialist
University of Kansas Libraries
Lawrence, Kansas

Mrs. Joan B. Harrigan
Consultant
Interlibrary Cooperation
Title III LSCA
Colorado State Library
Denver, Colorado

Miss Marilyn J. Miller
Coordinator of Elementary Libraries
East Hartford School District
East Hartford, Connecticut

Mr. Paladugu V. Rao
Reference-Circulation Librarian
Eastern Illinois University
Charleston, Illinois

Mr. David W. Taylor
Associate State Librarian
Planning and Research
Washington State Library
Olympia, Washington

The investigator was exceedingly fortunate to have a study team whose combined talent, background, and interest made the completion of the data collection for this report possible. Particular thanks go to Anna Condit and Joan Harrigan, who continued to tabulate the request sample after their field assignment was over. Joan Harrigan's specific recommendations on search strategy on page 32 indicate the depth with which she analyzed the search procedures.

This report was completed in August so that Miss Genevieve Casey, who has been conducting a survey during July and August of the membership of the Bibliographical Center, might have it as a source document iprior to the presentation of her own report to the Board of Trustees at its meeting of September 20, 1969. Together, these reports are to assist the Board in revising articles of incorporation for the Center with possible changes in its objectives and services.

Special commendation must go to Miss Phoebe Hayes, Director, and her staff, whose cooperation and assistance in the data collection were fundamental factors in the completion of this report. This investigator has not seen a group of individuals more poised under the stress of being analyzed. Mrs. Lupe Hillig performed the vital service of typing the final draft.

Members of the team expressed regret at not having more time in which to conduct their analysis and to discuss with Miss Hayes their recommendations as to operational efficiency and their reactions to the Swank Survey. It is the investigator's hope that this report will help to close the communication gap and add a sense of accomplishment to the memories of all who shared in this systems analysis.

Joan M. Maier
August 29, 1969

METHODOLOGY

The data collection was accomplished in three phases: (1) preliminary interviewing of the director and her professional staff; examination of statistical reports and financial records for the year 1968; (2) interviewing of individual members of the staff, flow process charting, and time observations performed by the study team; and (3) taking a statistically valid sample of the 1968 request file.

To orient the study team quickly to the Center's environment the investigator held a preparatory meeting July 24 during which the team received an explanation of these items in their work folders: a field study guide sheet, a floor plan of the Bibliographical Center, a personnel organization chart, a reprint of an article by Miss Hayes about the Center, statistics sheets, a copy of the Center's "Constitution and Bylaws", assorted data collection forms, and a Denver Public Library Guidebook. On July 28 the team also received a copy of the Swank Survey of April 1966 to add to their collection of background readings.

On Friday, August 1, after they had summarized the information from their time observation sheets and finished recording distances walked in the transportation steps on their flow process charts, the investigator held an evaluative session on operating procedures utilizing a tape recorder. The critique of the study team is summarized in the recommendations on operational efficiency on pages 12-18.

Each member of the team was given a specific section of the operations, as the framework for the analysis and ultimately for the cost calculations as well. These sections were administration, union card catalog maintenance, receipt and pre-processing of requests, searching, processing requests, post-processing and

making replies. Each analyst used a stop watch in recording his or her time observations. Activities which could not be time-observed were investigated by means of diaries kept by the employees themselves.

The group later discussed the thirty-three recommendations of the Swank Survey itself, without reference to the reactions of the Board of Trustees to these same recommendations as reported on November 2, 1966. A concise transcription of the tape of the discussion of the study team is archived at the Center.

The cost analysis methodology used was developed during Phase I of the Colorado Academic Libraries Book Processing Center Project. It is explained in detail in the final report of the project to the National Science Foundation in June 1968, and will be available this fall in book form under the title, Centralized Book Processing, published by Scarecrow Press. The standardizing factor (e) referred to in TABLE I of the labor unit cost calculation was derived from a passage in Henry Voos' Ph.D. thesis entitled, "Standard Times for Certain Clerical Activities in Technical Processing." (Rutgers, The State University, New Brunswick, N.J., 1964, p. 94). Voos lists the following elements which affect labor productivity, but which are difficult to obtain through direct time observations and diary study data. These are:

Unproductive Time	16.3%
Supervision	6.5%
Administration	3.8%
Instruction	5.7%
P = Total % (P)	= 32.3%

The standardizing factor was computed from the formula:

$$e = \frac{100}{100 - P} \quad \text{where } P = 32.3$$

$$e = 1.4771$$

Although a considerable number of statistical charts are being kept at the Bibliographical Center preparatory to the annual report to the Board of Trustees,

reports to the State of Colorado pertaining to the service contract with the Colorado Library System, income tax returns, and for general record purposes, the statistics needed for calculating the frequency percentages with which to model the importance of each activity reported on the labor chart, TABLE II, were largely unavailable. The strategy for calculating these frequency percentages is given on TABLE III. Percentages derived from the sampling procedure explained below are included in these calculations. The basis for comparison (the denominator of the frequency ration) is the total number of requests handled in 1968: 20,866. Every activity in the system is measured against that figure.

The investigator decided to take a sample of the 1968 request file utilizing the data sheet form in FORM I on page 63. Two members of the study team, the Director, and several members of the staff of the Bibliographical Center assisted in this phase of the data collection. The form of input/output -- TWX, interlibrary loan multi-form, I.L.L. form with TWX, telephone message card, letter/memo, and I.L.L. form reporting locations only -- were entered on the data sheet after the item request number. The size of the file was 20,866 requests in serial number order. By comparing the serial number of the request to the daily request-received roster, it was possible to determine on what date the item arrived at the Center.

Initially, the sample size was calculated as follows:

SAMPLE SIZE CALCULATION

N - Sample size
Np- 20866 (Universe)
σp- Confidence level(.05 error
θ- .50 (worst possible case)
*12 categories of data on sample form

$$\sigma p = \sqrt{\frac{\theta(1-\theta)}{N} \times \frac{Np - N}{Np - 1}}$$

$$\sigma p = \sqrt{\frac{.50\ (1 - .50)}{N} \times \frac{20866 - N}{20866 - 1}}$$

$$.05 \sqrt{\frac{.25}{N} \times \frac{20866 - N}{20865}}$$

$$.0025 = \frac{.25}{N} \times \frac{20866 - N}{20865}$$

$$.0025 = \frac{5216.5 - .25\ N}{20865\ N}$$

$$52.1625\ N = 5216.5 - .25N$$

$$52.4125\ N = 5216.5$$

$$N = 99$$

$$*12\ N = 1188$$

Sample Size = 1200

The investigator assigned numbers between 1 and 20,866 from a table of random numbers to 1,200 slips after which members of the Center staff matched requests to these slips. The slips were then partially tabulated on rosters (see FORM II on pages 64-69). However, the categories on pages 64 and 66 were completely tabulated and totaled for the cost study, and the percentages calculated, as reported in TABLE IV. The results of another tabulation of the sample for input/output format by location is found in TABLE V. This data on page of the roster and on the supplemental roster for input/output format yielded the necessary frequency ratios. The remainder of the data in the sample is pertinent to Miss Casey's survey of users and the Center's services to them.

The Center staff also compiled service statistics from the "Daily Statistical Record of Interlibrary Loan Requests". (See TABLE VI.) These figures reveal that in terms of customer satisfaction, requests for loan arrangements and locations were provided in 94.54% of the requests, of which 72.55% were satisfied within the region and 21.99% outside of the region.

E R R A T A

Page 8 **Line #7. Sentence should read, "This data on page 48, plus the data found on the supplemental roster on page 49 yielded the necessary frequency ratios".**

OPERATING COSTS

After the study team had turned in their mean observed times, they and the investigator decided upon a list of activities which described the repetitive labor being performed at the Center. The team also rated each person who was time-observed as to whether the employee was working above, at, or below her normal pace. The wage-per-minute for each employee was calculated so as to take into account unproductive time due to annual leave, sickness, or legal holidays. (See TABLE VII). The unproductive time factor within the standardizing factor pertains to such things as, for example, coffee breaks, personal telephone calls, idle chatter, etc. Having the mean observed time, frequency, personal rating factor, name and category of worker, and wage-per-minute for each activity, the investigator entered them on TABLE I and multiplied these factors with the standardizing factor to obtain the unit cost of each activity. The unit cost of supplies, overhead, and transportation were much more easily obtained than the unit labor cost. Transportation refers to movement within the system, i.e., the distance the employees walk during the performance of repititive tasks and relates to the arrangement of work stations and files. The source of these distances was a scale diagram of the floor plan (see APPENDIX C. VI) from which the team could record distances at transportation steps on their flow process charts. The walking speed of the average worker is 241.2 feet per minute as was time observed in Phase I of the C.A.L.B.P.C. Project. On TABLE VIII, this factor was used to convert distance walked into time spent. If the work was batched to move it from point A to point B, a batch factor was estimated and a unit distance calculated from that.

The items that comprise contractual overhead, administrative overhead, and

supplies were taken directly from the 1968 audit report of Miller & McCollom (see APPENDIX C. VII).The $1.00 per square foot paid to the Denver Public Library is highly competitive with the $4.00-to-$6.00 per square foot rate for prime office space in the downtown area.

TABLE IX cites the overall unit cost per request as $3.77 as of 1968. The cost of living rise must be considered when viewing the report findings in the context of 1969. It must be understood that $3.77 is not an average in the usual sense. It is a composite "model" within which all the variables affecting cost have been weighted as to their importance (or frequency of occurrence) within the total system of operations. Three dollars and seventy-seven cents is therefore not to be used to negotiate costs in contract agreements. If the labor costs are calculated again with the frequency percentages taken out, the actual unit cost of individual activities becomes apparent. Therefore, from TABLE II it is possible to construct a fee schedule based upon input format and service performed regardless of the type of library initiating the request, and for Colorado System libraries. There are costs that remain relatively constant and can therefore be used to calculate a basic charge:

Overhead	$1.2347	
Supplies	.0527	
Transportation	.3005	1.5879
Labor Activities		
Administration (#1-3)	.0274	
File Maintenance (#4-10)	.0711	
Clearing (#27)	.0420	
Statistics (#28)	.0303	.1708
Total	$1.7587	$1.7587

To this basic charge can be added different charges depending upon the services performed on a given request. Here are two examples:

Example I

Service Charge for the Colorado System

Activity #		Unit Cost
11	Colorado System TWX Request	$ .0699
14-16	Searching (simple)	.2527
21	Processing request (incl. ILL	.4362
23	Colorado System reply form)	.1390
Total		$ .8978

Example II

Service Charge for Other Requests

Activity #		Unit Cost
12	All Other TWX & Mail Requests	$ .0479
17-19	Searching (simple)	.2625
21	Processing Request	.0571 *
25	Other TWX Replies	.1157
Total		$ .4832

In the category of special charges would be:

20	Problem Searches	$ 2.2695
22	Circularizing TWX Requests	0.5455

Since there are twelve activities which constitute a basic charge out of a total of twenty-nine, that leaves seventeen activities out of which service combinations could be made. The number of possible combinations is

$$\frac{17 \times 16 \times 15 \times \ldots 1}{3}$$

--certainly more than the Center would be likely to need to use. The calculation of the fees using service or activity combinations is an accounting operation more likely to be handled by a computer or unit record equipment than by the present manual bookkeeping procedures.

* Note: $.0571 is 13.1% X $.4362 since 86.9% of all requests are other requests that do not require the typing of the I.L.L. Form. 2723 Colorado System TWX requests is 13.1% of 20866 (1968 total requests).

RECOMMENDATIONS

Two kinds of recommendations will be represented in this section of the report (1) those relating to operational efficiency; and (2) those relating to the fundamental objectives and fiscal base of the Bibliographical Center. In Part 2 there will also be a summary of the reactions of the study team to the Swank Survey Recommendations.

OPERATIONAL EFFICIENCY

As in the cost analysis there are seven categories of activity: administration, union card catalog maintenance, receipt and pre-processing of requests, searching, processing requests, post-processing, and making replies. Using his or her flow process chart as source document, each analyst delivered an oral critique before the group. These remarks and the reactions of the group were tape-recorded. The investigator later studied all charts, flow diagrams, and the tape for the purpose of summarizing the findings of the group.

Administration

In APPENDICES C: VIII & IX are an inventory of forms used and files maintained. Both lists are formidable. That an enterprise funded at the $80,000-per-year level should maintain thirteen files covering sixty-three categories in order to function is an immediate question. There is an equally elaborate collection of forms in use, many of the most-used ones being statistical in nature. The most important single form is, of course, the interlibrary loan request multiple form, which is the one adopted as a standard by the American Library Association. Setting aside the larger question of revising the I.L.L. standard form, this investigator will discuss the form as it is used throughout the service functions of the Center.

Statistics are being kept at various points in the system. The requirements of the Colorado state contract engender a special set of statistics that would

otherwise not be tallied. It should be possible to record all service and accounting data at the point of input and output. If a Hollerith card could be punched for each transaction coding in all desirable data on input, then retrieving it to punch in the concluding output data, these cards could be sent to a service bureau to be run on either a computer or unit record equipment to produce accounting reports, invoices, and the statistical frequencies and percentages necessary to management. The request number itself could be a code such as:91810500235

9	181	050	0235
(year)	(day of the year)	(item received that day)	(membership number)

and so forth. By using the year and day of the year each searcher would know without having to consult the daily log as to when the item arrived at the Center. Once the requestor characteristics are recorded on tab cards, the data can be combined and correlated in any desired combination at any time. The information now recorded manually in the Kardex of memberships, the daily request log, the daily TWX log, etc. could be replaced. Administrative time is being taken to check the TWX bills against the TWX log. If an additional carbon copy were added to the paper roll, these could be saved and sorted once per month according to receiver to check the bill rather than keeping it on a continuous daily basis. An alternative to this is to code it on the request tab card and have a TWX-transaction-report run.

If mechanization of the operating records is not economically feasible at this time, there are other kinds of changes that would require little or no funds to implement. For instance, a photocopy of the Kardex card rubber-stamped with payment instructions might serve to invoice the member libraries. Moreover, it should be possible to bill each member only once per year, preferably at the beginning of the fiscal year (July). Twenty hours per week of accounting is a lot of activity for $80,000. Time sheets and payroll reports add to the accounting load. A time clock

would be more accurate and less time consuming for all employees, including the bookkeeper. If the time clock were adjacent to her desk and her desk were adjacent to the Kardex, the bookkeeper would have very little walking to do. Perhaps a trial period on usage of a time clock would elucidate its effect on both cost and staff morale.

A third gadget which could save walking and time is a desk photocopier. Since most of the photocopy work required by the Center is sheet rather than book copying, a desk machine would be far more convenient than the xerox machine in the Denver Public Library Order Department.

Other minor topics are the use of self-carboning paper for correspondence, for invoices, etc. A signature stamp for checks and for routine correspondence would relieve the Director of some tedium and speed up these processes.

Union Card Catalog Maintenance

Here again statistics are being kept daily by individual employees. If the purpose for keeping them is to gauge the size of the file, a measurement of cards being discarded could be done once per day by one person, and the totality of the files measured on the last day of each year, according to its several categories. As to individual filing productivity, a diary study every three or six months could yield this information. Filing statistics compiled for this report and archived for future reference provide a range of productivity ratios against which each filer could measure his own performance. APPENDIX C: X reports backlogs in the filing. Perhaps performance standards would provide motivation to the filers. In Centralized Book Processing are described the forms and methodology for a type of staff-wide diary study that could yield sufficient data for the derivation of performance standards within the Center's own system without occupying the energies of the staff throughout the work year. The suggested time frame for such a study totals two weeks, each diary week being separated by at least a six-week's interval,

so that the degree of variation reporting can be pinpointed.

The sampling of the 1968 request file indicated a union file usage as follows:

Pre-1956	48.0%
1956-1965	33.6%
1966+	17.1%

Cards arriving in the pre-1956 category are being stored at present because this file is being edited and weeded in order to make it ready to submit to the National Union Catalog retrospective catalog.

In spite of the filing backlog, the recommendation here is to combine the union files into one file, once the fate of the pre-1956 file is determined by the National Union Catalog. This means getting rid of the Lektriever and arranging the card cabinets in sequence order preferably around the outer walls of the room. The fact that the Lektriever takes only one minute of searching time as opposed to six minutes by manual search , makes this choice a difficult one, particularly since the Lektriever occupies only about 70% of the square footage required for standard catalog card cabinets. If appropriate space for the Center could be provided on the first floor of Denver Public Library, there would be then a rationale for having Lektrievers for the entire file. Space at the commercial rate in some other building could quadruple the institutional overhead of the Center. There is also the advantage of being adjacent to the Denver Public Library official catalog, maintained by the Catalog Department on the third floor. This amalgamation of the file might increase search time in the middle category of imprints; however, it would simplify the overall search strategy considerably. More on this subject is discussed under "Searching". At the present rate of 55 cents per entry by the Datatext (International Business Machines) method, the idea of committing over four million cards to machine-readable form is hardly a practical one. That

is a project best left to the National Union Catalog, from which regional centers can draw data banks at some later date.

Receipt and Pre-Processing of Requests

For present statistical requirements, the receiving clerk first sorts requests by requesting library, then sorts them by file category. The Colorado System TWX messages are also sorted out from other libraries, and are given priority. The lag time average on the handling of the latter group is less than one day. Here again, this clerk seems to be the one in the best spot to keep all service statistics because she also handles the output. It is desirable that the TWX message be so formated as to serve as the mail request form also; but that reverts to the larger question of one national standard on I.L.L. input and output.

Searching

The searching strategy seems to be unnecessarily complex due to the imposition of artificial categories to the daily load such as Colorado vs. other requests and the date of receipt. The amalgamation of the files would eliminate a third sub-set -- the imprint category. There are four basic recommendations here to simplify the search procedure:

1. Use a single input box with all requests interfiled.

2. Assign searches in batches of 20. Timed observations indicated 20 to be the optimal batch number.

3. Try this controlled experiment: eliminate the work slip form by having the searcher print in red directly on the I.L.L. form. They need record only substantive corrections (i.e., those which prevent searching). There is much concern over the appearance of the form resulting in wasted effort for both the searcher and the processing clerk. Substitute the other-locations form for the work slip so that searchers can check off location coding directly on this sheet. If the number of locations is small the searchers can print the location codes directly on the sheet in red. A clipboard to allow them to press heavily on the form so that the carboned sheets will also receive

3. the information, should be provided to each searcher. Initialing the front of the form rather than the verso and in the same area of the form would save the reviser some time.

4. Searching revision should be done consistently on all forms; however, if the level of substantive error is below the one-percent level, the revision step could be done on a sampling schedule.

In short, the categorization of the search load into sub-sets of the main entry creates parallel searching operations and causes the transportation factor to be disproportionately large (see TABLES VIII-LX). The Proposed Searching Method diagramed by Mrs. Harrigan eliminates the obvious parallel procedures of the Present Searching Method (see CHARTS II & III). CHART II was diagramed initially by Mrs. Harrigan and revised for accuracy by the Director.

The request sample indicated that 19.1% of the requests come in unverified. If a special charge is levied against unverified requests, this activity would probably diminish as the offending libraries make a more concerted effort to do their own verifying or have it performed within the state system before it reaches the Bibliographical Center.

The Center is also handling Colorado requests which should be handled by the Denver Public Library (Statewide Reference Service), since Denver Public Library has a contract with the State Library to function as the statewide reference center. Perhaps a clearer delineation and application of the roles of Denver Public Library and the Center within their respective state contracts would reduce the number of searches that the Center has to perform at present. The Colorado State Library also needs to enforce quality control within the System as to what is put on the TWX network.

Processing Requests

If the searches were to print the information they find in the union files and elsewhere directly onto the I.L.L. form, much of the typing that the processing clerk meticulously does not could be eliminated. Since this individual also does

some of the searching, she is capable of a higher level of activity than transcribing the information on the work slips to the I.L.L. forms. Of course, problem searches will continue to need transcription because of the copious notes involved. Too much of the processing relies on this one employee; if she is absent, there is a bottleneck. Perhaps the desk of the processing clerk could be moved adjacent to the input/output clerk since their work is so interwoven. Here again, an extra carbon copy on the TWX machine and a photocopy machine in the Center would eliminate some work for the processing clerk.

Post-Processing and Output

There is a question of whether the TWX is being used effectively for the Colorado System when a TWX request results in an interlibrary loan arrangement because of the necessity of typing the I.L.L. form for the requesting library. The typing process can delay the transaction for several days; during which time the request could have come through the mail from the requestor. The cost of postage for the Center in 1968 was $584.18. The cost of teletype service alone, not counting the administrative checking of the bills on it, was $2,993.73 or approximately five times the cost of postage. This teletype charge includes the machine in the Bibliographical Center and six TWX machines of the Colorado System. If one assumes typing time on the teletype is the same as typing time on the standard form, there seems to be little real service advantage to the requesting library and considerable increase in operating cost to the Center. The use of the TWX for location-only requests seems straight forward and reasonable. Once again, one standard form that can either be TWX'd or typed seems to be a general solution that could be universally applied.

General Recommendations

Use of Personnel

The Proposed Organization Chart on page 26 recommends that the Director be given an administrative assistant to supervise all operations. The Director should enclose her office and receive no operational telephone calls. Her duties should be developmental, public relations, and consultative in character. She should be given the necessary data for completing annual and other reports, but should leave the gathering of this data to her administrative assistant.

The administrative assistant in turn should have one requests supervisor, one filing supervisor, and a secretary/bookkeeper. All activity on the input, searching, processing, and output of requests should be under the requests supervisor. All activities involving the maintenance of the union file should be the responsibility of the filing supervisor.

This recommendation for staff reorganization is based upon the assumption that the recommendations in the previous section, especially those regarding search strategy and elimination of much of the typing now down by the processing clerk, are in fact implemented. It cannot be over-emphasized that the Director must be freed from the operational routines if the Center is to survive.

Relationship with the Denver Public Library

The location of the Center at Denver Public Library since its inception has caused the Center to be identified more closely with public library service rather than with the academic and research communities, and with Colorado public library development rather than with regional library development. The fact that the Denver Public Library is also the Statewide Reference Center under contract from the Colorado State Library means that there are three levels of service located in one

building -- local, state, and regional. Ideally, the Bibliographical Center, as a service organization for all types of libraries throughout the region, would be located on neutral territory. Realistically, at $1.00 per square foot there is a powerful incentive to remain within Denver Public Library, as well as for shared use of its bibliographic resources. If the functions of the Center change and the funding becomes more reliably based, the Board might give serious consideration to renting quarters elsewhere where Lektrievers could be used to house the entire union file, unless some permanent quarters in Denver Public Library on the ground floor can be agreed upon. Meanwhile the respective roles and responsibilities of Denver Public Library and the Center with regard to the handling of requests must be carefully monitored. Once the new articles of incorporation, and the constitution and bylaws are re-drafted, the Director must insure that the location of the Center at Denver Public Library does not affect either the new policies or procedures to the disadvantage of the Center. For instance, the pay scale at Denver Public Library need not necessarily be the one the Center has to use for new professional positions if it reorganizes.

Mechanization of Administrative Records

There is a definite need to automate the administrative record-keeping procedures and to build technical competence and sophistication within the Center's staff in the use of automated records. The best way to achieve this is to hire a systems analyst at least half-time on a continuing basis. To attract this kind of personnel and retain them, the pay scale has to be competitive. The administrative assistant for Miss Hayes, in effect her business manager, should also be acquainted with automation applications if the Center is to take advantage of the improvements that mechanization can offer. Eventually competence in the use of MARC tapes and other machine data bases may spell life or death for the Center.

Records are relatively easy to convert or retread compared to humans -- the latter take a while! 1959, not 1969, would have been a better time to start doing it, not just at the Center, but profession-wide.

Tied back to the Center's need to explore the advantages of mechanization and automation is the educative (propaganda?) function that the Director is in an excellent position to exercise if she has the time. Certainly, if the method of levying charges is changed, she may have no choice, but to take the time to sell the new method to the member libraries.

Funding and the Relationship of the Center with its Constituents

Perhaps the successful collection of dues and fees is partly a matter of attitude. As one of the study team observed:

> "The Bibliographical Center is so service-oriented that I don't believe the word 'no' is in the staff's vocabulary. A more business-like attitude toward the membership would be: 'We have a product that you need and a service guarantee. Let us enter into a business arrangement. We will provide an answer to your request within a fixed period of time. We are a private corporation operating on the cost-benefit principle, not a public library agency.'"

The cost analysis in this report indicates strongly that a revised fee schedule should be adopted. Naturally,this schedule shouldn't be based upon <u>ability</u> to pay,but rather payment for the type of service rendered. Small libraries not in state system may find the fee schedule concept beyond their means. These libraries must affiliate themselves with larger, more economical units of service which can afford to pay for what they receive. The Center has been in effect subsidizing the operations of these small libraries. This must stop! It may be cruel on a short term basis, but on a long range basis, it means stronger library development state by state throughout the region.

The levying of a differentiated fee schedule is half of the new loaf of membership. The other half is a distinct contract with each library citing the responsibilities of that library with regard to the form and quality of the request input and with regard to that library's contribution of cards to the Union Catalog. The character of the contribution should be described and later monitored at intervals at the Center. The cooperative aspect of this effort must be emphasized again and again if the Union Card Catalog is to continue to grow and truly reflect the resources of the region.

Board Structure

The study team concluded that the Board should consist of one representative from each state with which the Center has a contract. If there is no state contract, the heads of the member libraries within a given state should elect a representative to the Board. The intent here is to provide geographic representation leading to statewide systems and eventually to contracts where none can be negotiated at the present time. There should also be two members-at-large, preferably the top two officers of the Mountain Plains Library Association, to retain the viewpoint of the profession as a whole in the region. There should also be a member-at-large from the National Union Catalog staff as there seems to be difficulty in knowing what National Union Catalog is doing and planning to do at any specific time.

Research and Development

There is a cost benefit mathematical managerial model which was developed by the Colorado Academic Libraries Book Processing Center Project, Phase I, in 1967 and 1968, primarily by the investigator and Westat, Inc., a statistical consulting firm with offices in Denver. It may be possible to convert the data

in the cost analysis section of this report to computer input for the model in order to optimize the cost benefit ratio through trial of different combinations of variables such as labor activities, supplies, personnel assignments, frequencies, volume levels, etc. This canned program cost $20,000 to develop initially. If the Board determines that the Center needs to use this kind of tool, it is possible for them to contract with the investigator to develop the input deck, provided computer fees are also budgeted for this effort.

Network simulation models and projection models might well be utilized by the Automation Committee of the Board as a followup to Miss Casey's report and recommendations.

Identification of New Areas of Service

The study team concurred with the Swank Survey that service contracts with state libraries is the soundest (and perhaps the only) political and economic foundation upon which the Center can build a regional service which complements both the local efforts and those at the National Union Catalog.

In the sample of the 20,866 - 1968 request slips, less than one per cent of these were for the location of non-book materials. This is an area of service that no agency is performing comprehensively at the regional level, either in compiling a union catalog or on providing locations from it. Through work with the school library consultants, state departments of education, and coordinating councils in higher education, the Director might identify whole new areas of service and support. College and university libraries are concerning themselves more and more with the control and sharing of these expensive resources. The National Union Catalog needs help from all quarters in establishing cataloging standards for media in all its manifestations.

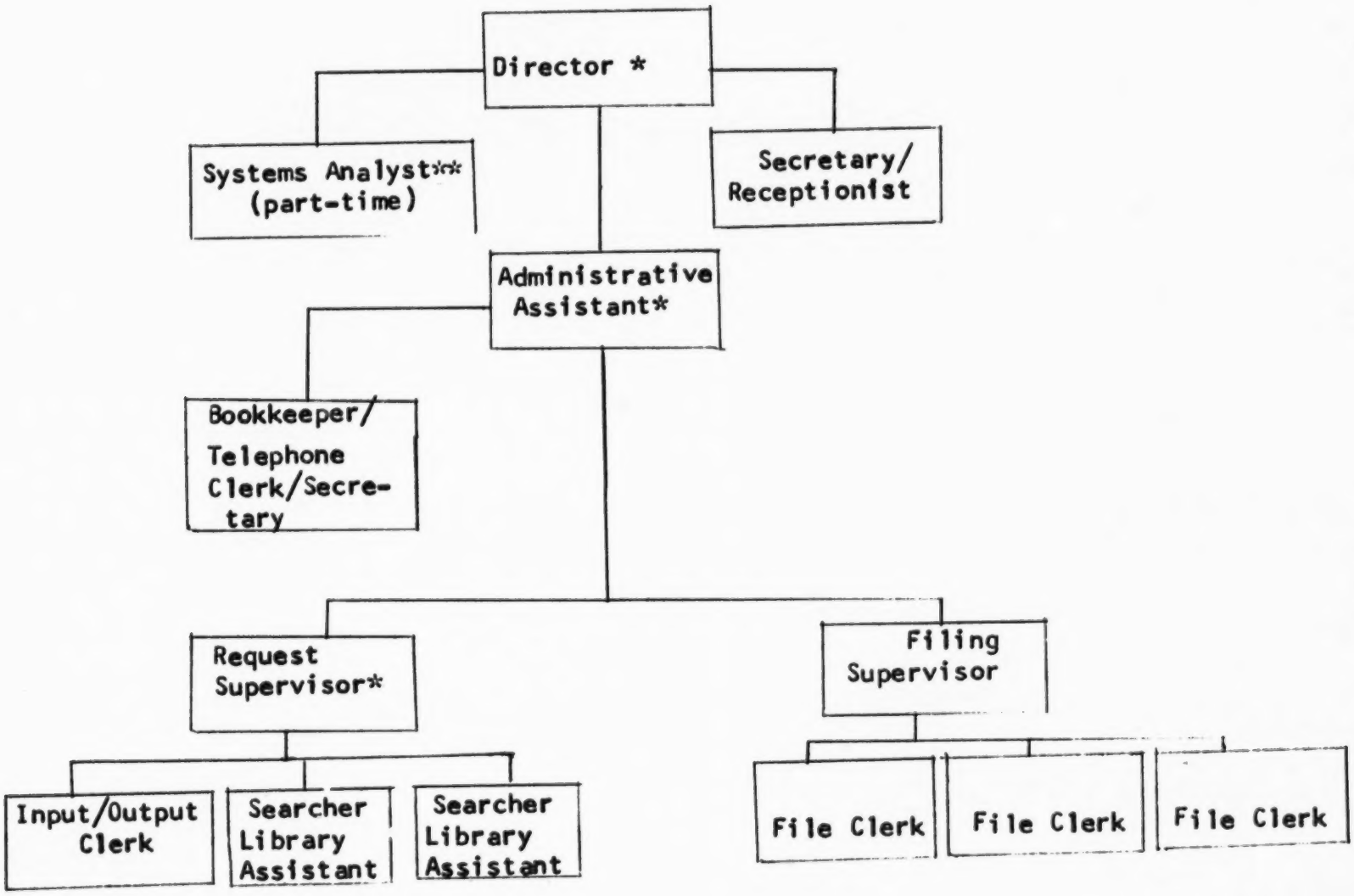
Summary of Recommendations

1. Streamline the manual system at the Center.
2. Reassign tasks so that the Director has time to implement what the Board recommends.
3. Establish and levy a revised fee schedule and make a firm agreement on card contributions and input control with each member library.
4. Mechanize the administrative record keeping.
5. Change the structure of the Board to one representative per state, and to two members-at-large from Mountain Plains Library Association, and one member-at-large from the National Union Catalog.
6. Budget for research and development so that the Director can hire a systems analyst or analysts to begin working on Recommendation #4.
7. Assign priorities and a schedule to whatever recommendations are adopted with specific authorization to the Director to hire or contract for service specialized personnel to implement these recommendations.
8. Identify and mount programs to meet the needs of new areas of service such as the control of media resources in all types of libraries in the region.

APPENDICES A. Charts and Tables

CHART I

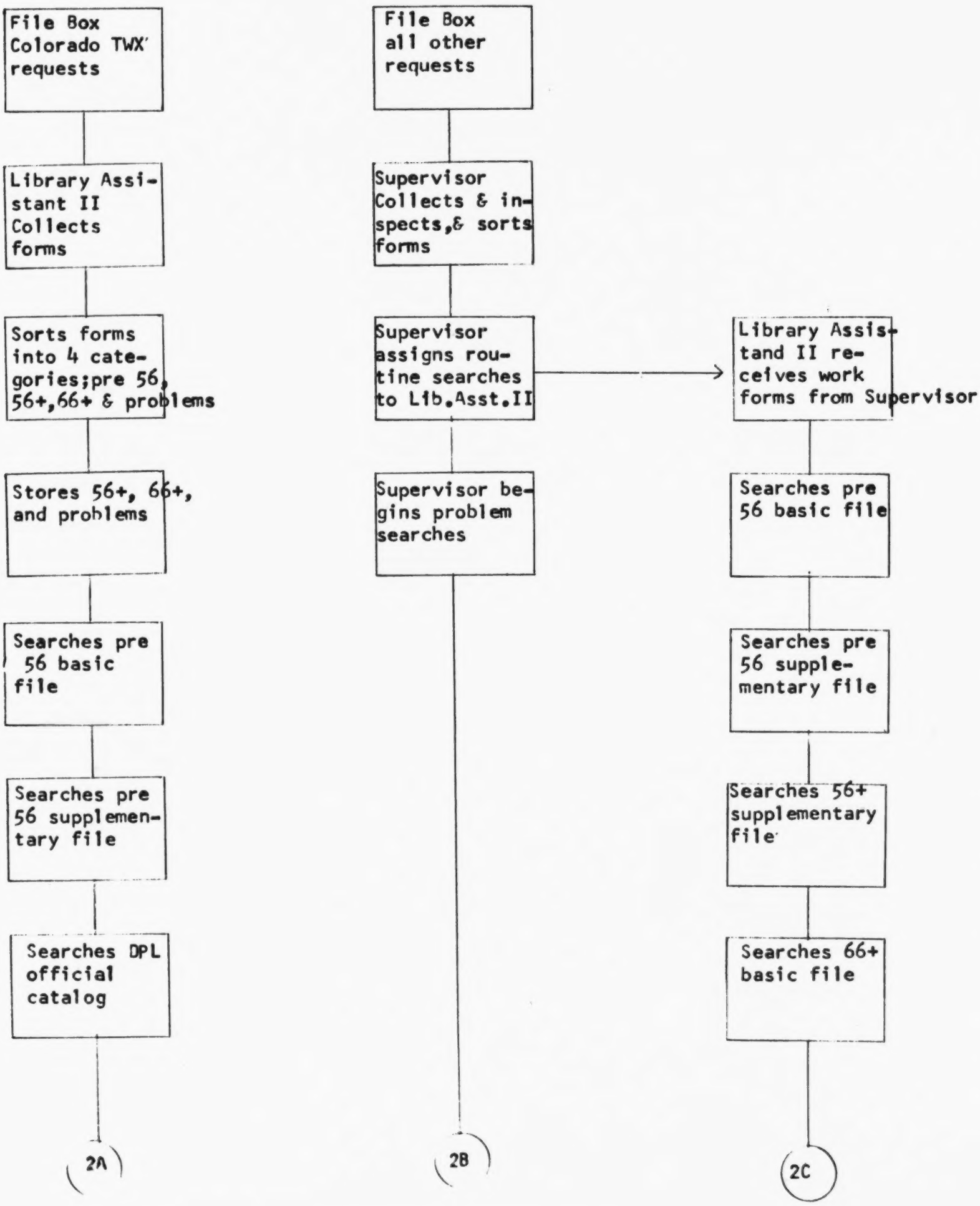
PROPOSED ORGANIZATION CHART



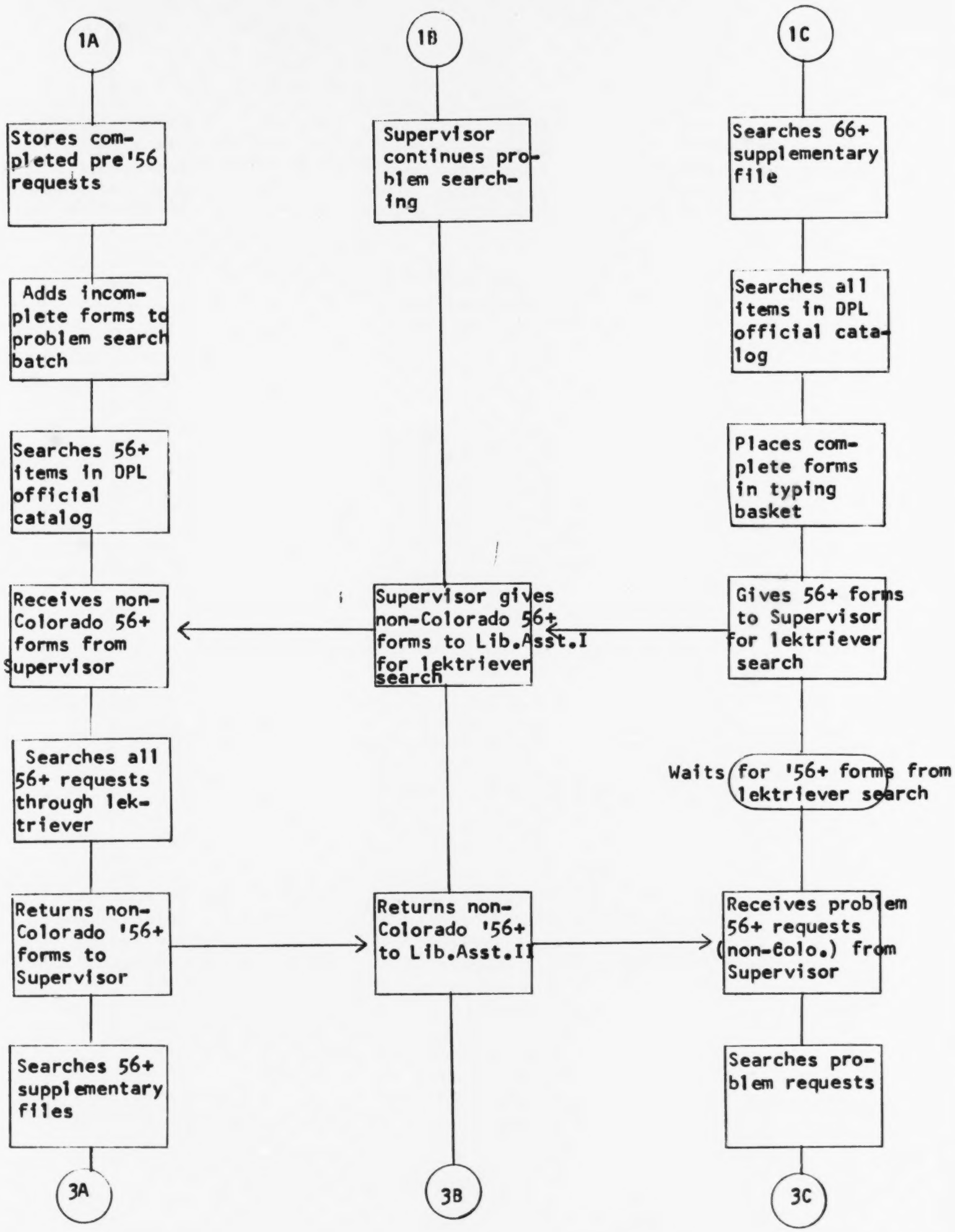
* Professional Librarian.
** Need not be a Professional Librarian, but must have experience in automation projects in the library/information environment.

CHART II

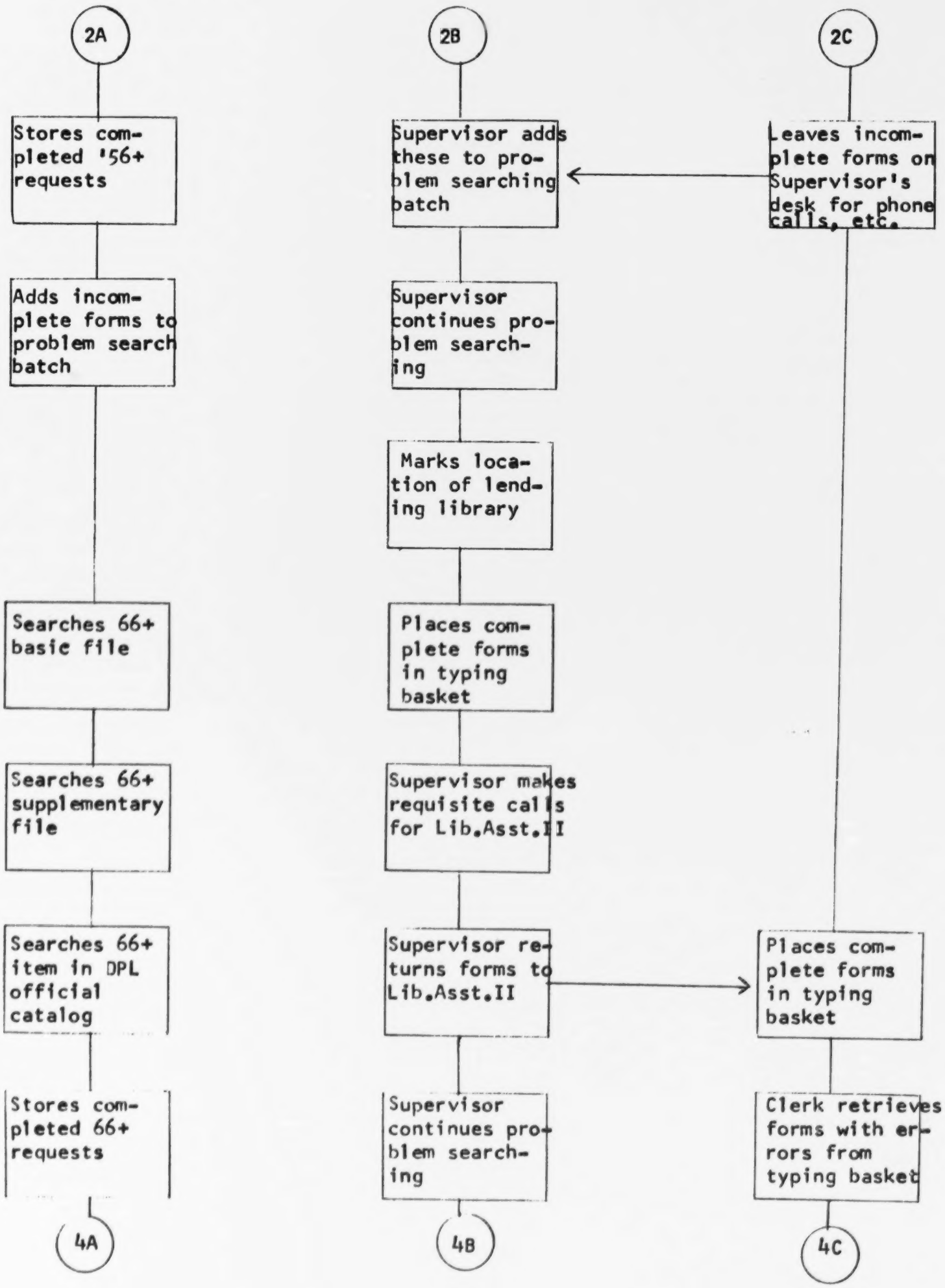
PRESENT SEARCHING METHOD



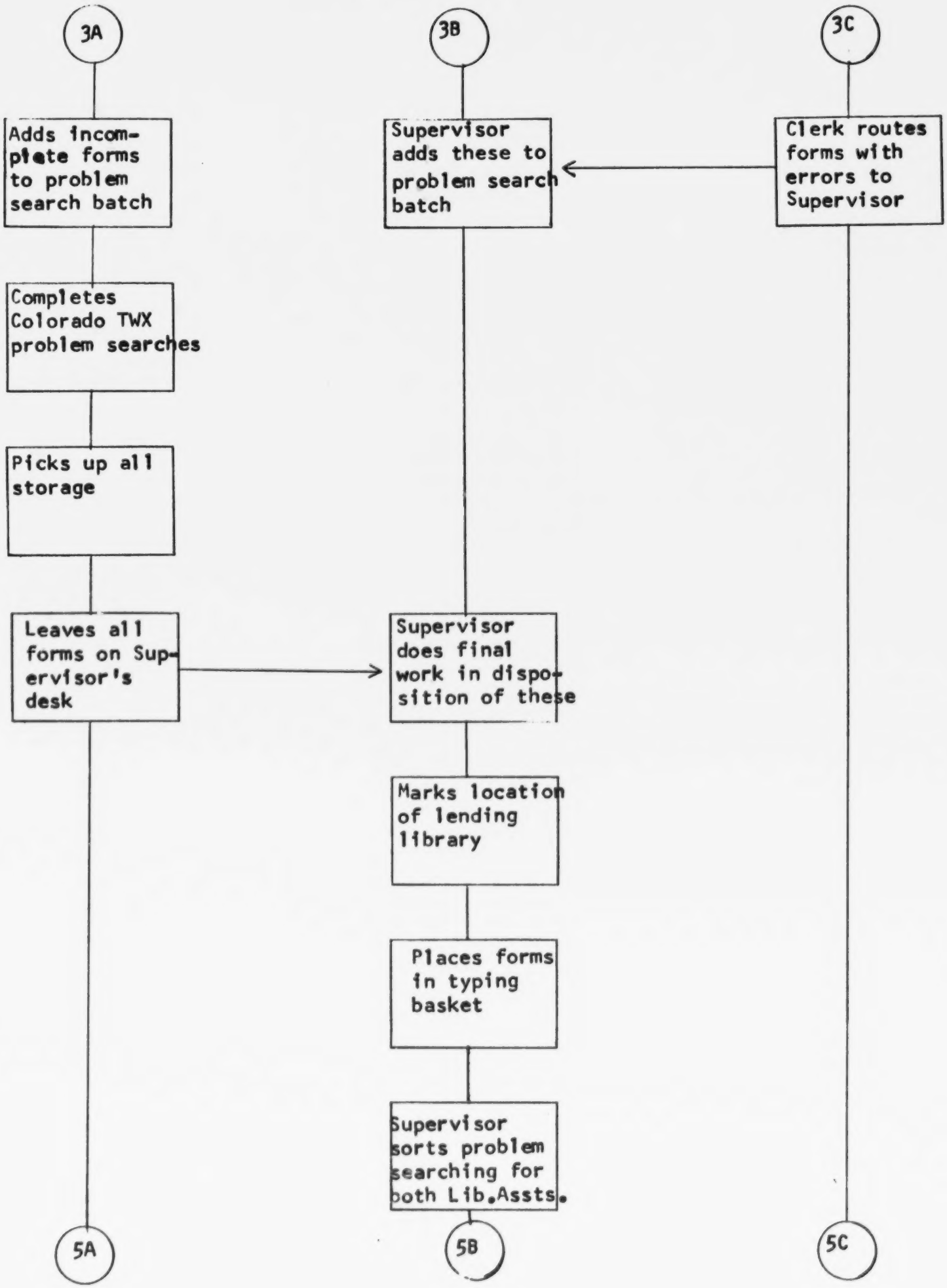
Present Searching Method (cont.)



Present Searching Method (cont.)



Present Searching Method (cont.)



Present Searching Method (cont.)

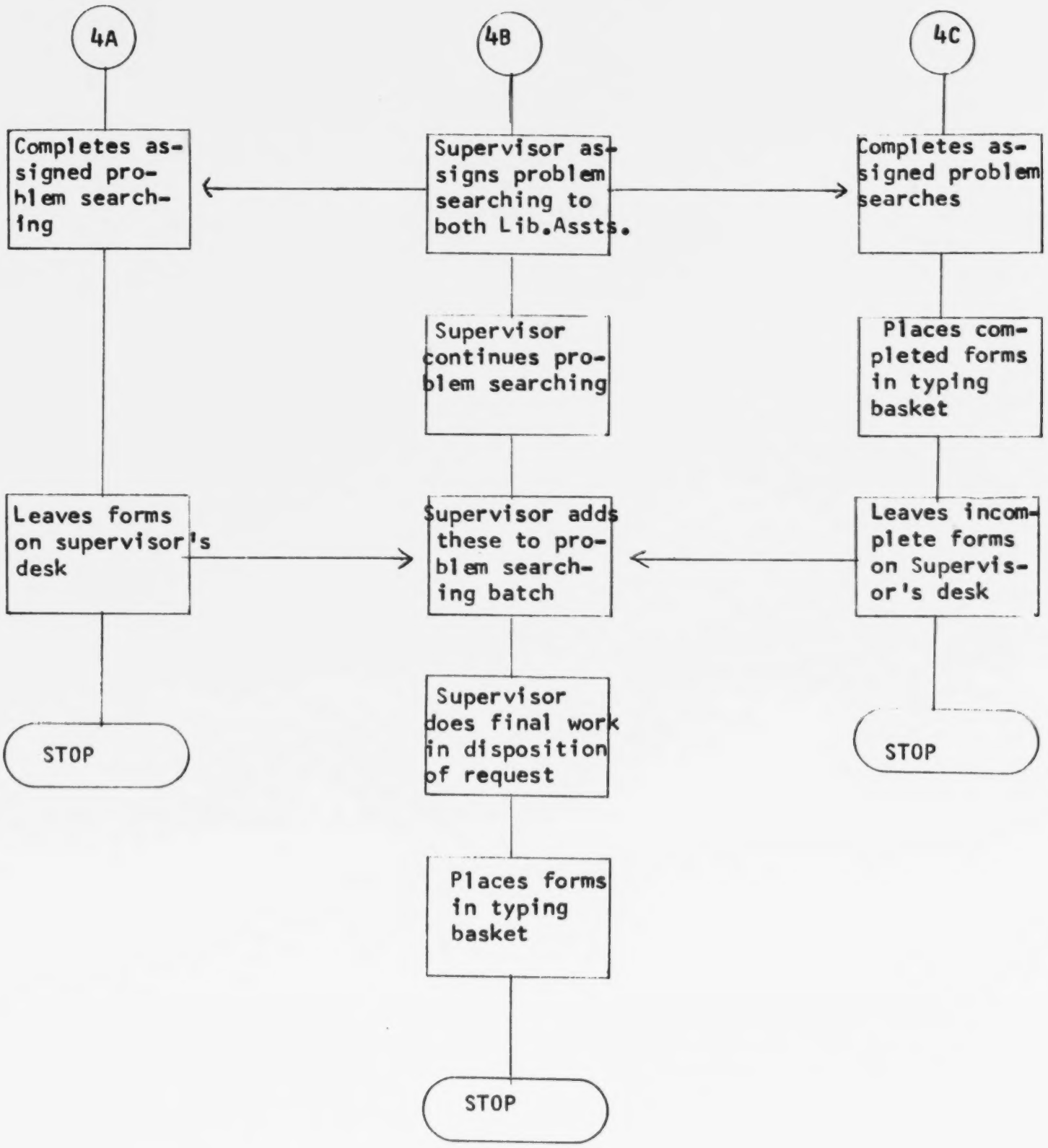
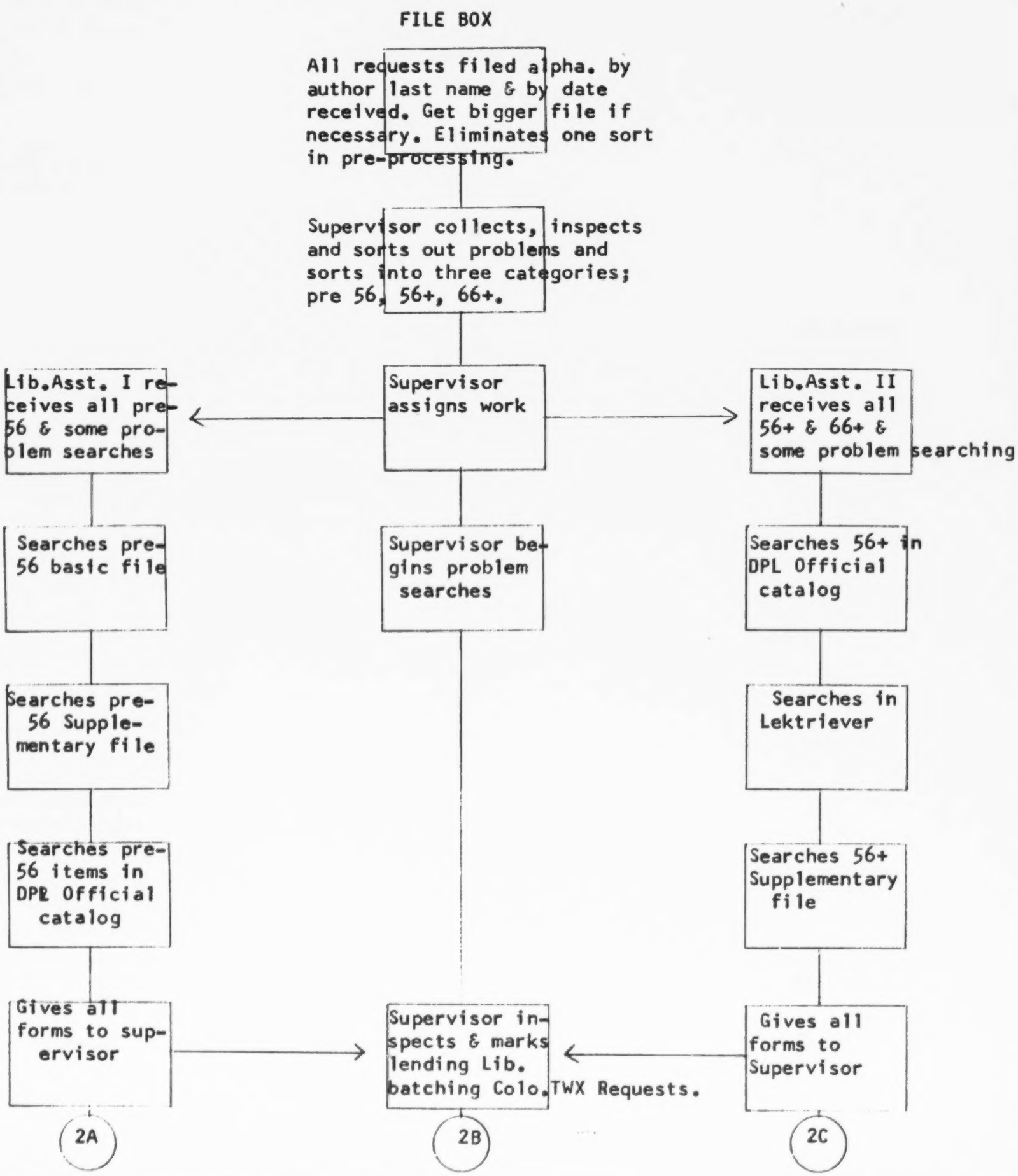


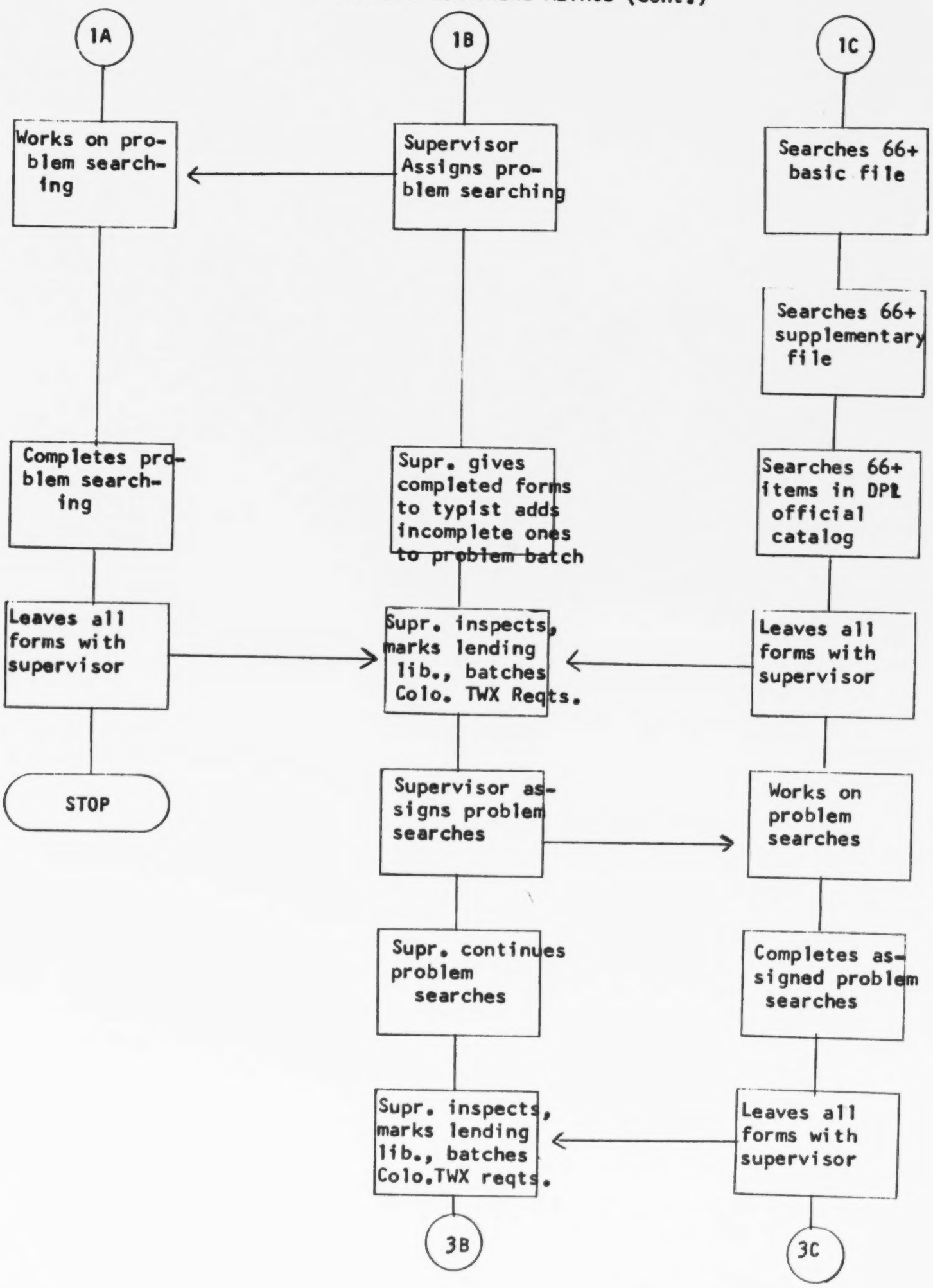
CHART III

PROPOSED SEARCHING METHOD

This method would cut major transportation almost 50 o/o since only one employee is doing a procedure instead of both doing parallel routines. Optimum batch sizes (15-20) should be used wherever possible. High density searching is faster.



PROPOSED SEARCHING METHOD (cont.)



PROPOSED SEARCHING METHOD (cont.)

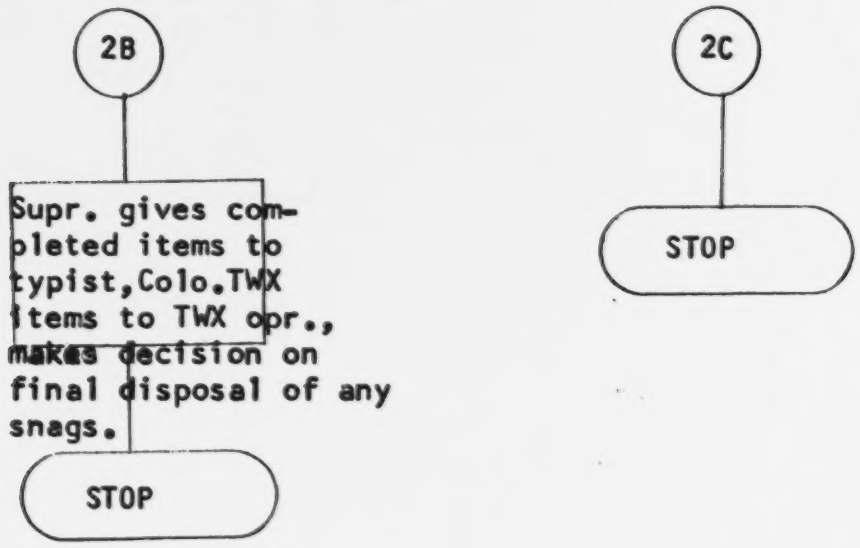


TABLE I

LABOR (L)
UNIT COST CALCULATION FOR BIBLIOGRAPHICAL CENTER ACTIVITIES

Code	ACTIVITY DESCRIPTION	a Observed Mean Time	b Frequency	c Adjusted Time	d Personal Rating Factor	e+ f Standard Time	g Category of Worker	h W Wage / Minute	i Cost of Activity
	ADMINISTRATION								
1.	Preparing invoices	6.661	0.024	0.160	1.00	0.2363	Clk 2 Alcaro	.0356	.0084
2.	Calculating payroll; paying bills	5.156	0.024	0.124	1.00	0.1832	same	.0356	.0065
3.	Typing correspondence	5.000 est.	0.062	0.310	1.00	0.4579	Clk 1 Hillig	.0316	.0145
	UNION CARD CATALOG MAINTENANCE								
4.	Sorting cards by first letter	0.051	32.977	1.682	1.20	2.9814	Clk 1 Heilemann	.0361	.1076
5.	Sorting cards by date	0.099	32.977	3.265	1.20	5.7873	same	.0361	.2089
6.	Alphabetizing cards from pre-file for blending	0.093	32.977	3.067	1.25	5.6628	Clk 1 Dyes	.0282	.1597
7.	Blending into 1956+ supplementary file	0.306	12.966	3.968	1.00	5.8611	Clk 1 Wilson	.0219	.1284
8.	Blending into 1966+ supplementary file	0.311	2.195	0.683	1.25	1.2611	Clk 1 Wilson	.0219	.0276
9.	Filing into basic 1966+ file	0.469	4.026	1.888	1.15	3.2071	Clk 1 Chacon	.0344	.1103

+ Standardizing factor: 1.4771 ; Col. e above is to read as this standardizing factor for each activity.

LABOR (L)
UNIT COST CALCULATION FOR BIBLIOGRAPHICAL CENTER ACTIVITIES

ACTIVITY DESCRIPTION Code	a Observed Mean Time	b Frequency	c Adjusted Time	d Personal Rating Factor	e+ f Standard Time	g Category of Worker	h W Wage/Minute	i Cost of Activity
10. Coding	0.155	32.977	5.111	1.25	9.4369	Clk 1 Sanchez, C	.0274	.2586
RECEIPT AND PRE-PROCESSING OF REQUESTS								
11. Colorado System TWX Requests	1.367	0.131	0.179	1.00	0.2644	Clk 1 Sanchez, A	.0346	.0091
12. All other TWX and mail requests	0.933	0.824	0.769	1.00	0.1136	same	.0346	.0393
13. Telephone requests	0.511	0.046	0.024	1.00	0.0355	same	0.346	.0012
SEARCHING								
14. Searching TWX requests from Colorado Systems Libraries in pre-1956 file	6.841	0.063	0.431	1.00	0.6366	LA 2 Nichols	.0461	.0293
15. Searching TWX requests from Colorado Systems Libraries in 1956+ files	1.879	0.044	0.083	1.00	0.1226	same	.0461	.0057
16. Searching TWX requests from Colorado Systems Libraries in 1966+ files	2.413	0.022	0.053	1.00	0.0783	same	.0461	.0036

+ Standardizing factor: 1.4771; Col. e above is to read as this standardizing factor for each activity.

LABOR (L)
UNIT COST CALCULATION FOR BIBLIOGRAPHICAL CENTER ACTIVITIES

Code	ACTIVITY DESCRIPTION	a Observed Mean Time	b Frequency	c Adjusted Time	d Personal Rating Factor	e+ f Standard Time	g Category of Worker	h W Wage/ Minute	i Cost of Activity
17.	Searching other requests in pre-1956 files	3.079	0.417	1.234	1.10	2.0050	**	.0646	.1296
18.	Searching other requests in 1956+ files	2.597	0.292	0.758	1.10	1.2316	**	.0646	.0796
19.	Searching other requests in 1966+ files	1.827	0.149	0.272	1.10	0.4419	**	.0646	.0285
20.	Problem searches	14.253	0.087	1.240	1.00	1.8316	Dir. Hayes	.1078	.1974
	PROCESSING REQUESTS								
21.	Arranges loan on mail requests or provides location information, or both	7.424	0.832	6.177	0.90	8.2116	Clk 3 Aranda	.0442	.3630
22.	Circularizing TWX Requests	9.284	0.008	0.074	0.90	0.0984	same	.0442	.0043

+ Standardizing Factor: 1.4771 ; Col. e above is to read as this standardizing factor for each activity.
** Searching is performed during the study by three persons, for which a weighted wage rate was calculated:

Searchers	Wage Rate Per Minute	o/o of Time Searching	Weighted Wage Rate
Supr. Durzo	.0757	50	.03785
LA II Dibble	.0583	30	.01749
LA I Nichols	.0461	20	.00922
		TOTAL	.06456

LABOR (L)
UNIT COST CALCULATION FOR BIBLIOGRAPHICAL CENTER ACTIVITIES

ACTIVITY DESCRIPTION Code	a Observed Mean Time	b Fre-quency	c Adjusted Time	d Personal Rating Factor	e+ f Standard Time	g Category of Worker	h W Wage/ Min.	i Cost of Activity
POST-PROCESSING OF REQUESTS&MAKING REPLIES								
23. Colorado System TWX replies	2.719	0.131	0.356	1.00	0.5258	Clk 3 Sanchez.A	.0346	.0182
24. L.C. circularizing requests	4.675	0.008	0.037	1.00	0.0547	same	.0346	.0019
25. Other TWX replies	2.263	0.126	0.285	1.00	0.4210	same	.0346	.0146
26. Mail answers	1.807	0.915	1.653	1.00	2.4416	same	.0346	.0845
27. Clearing	.0822	1.000	0.822	1.00	1.2142	same	.0346	.0420
28. Statistics (preliminary to billing)	0.592	1.000	0.592	1.00	0.8744	same	.0346	.0303
MISCELLANEOUS								
29. Telephone calls	6.000est.	.100	.600	1.00	1.0862	**	.0646	.0702

+ Standardizing Factor: 1.4771 ; Col. e above is to read as this standardizing factor for each activity.
** Weighted wage rate for searching

TOTAL UNIT LABOR COST: $2.1828
or $2.183

TABLE II

LABOR (L)
UNIT COST CALCULATION FOR BIBLIOGRAPHICAL CENTER ACTIVITIES
WITHOUT THE FREQUENCY PERCENTAGES

ACTIVITY DESCRIPTION Code	a Observed Mean Time	b Frequency	c Adjusted time	d Personal Rating Factor	e+ f Standard Time	g Category of Worker	h W Wage/Min.	i Cost of Activity
ADMINISTRATION								
1. Preparing invoices	6.661			1.00	9.8390	Clk 2 Alcard	.0356	.3503
2. Calculating payroll; paying bills	5.156			1.00	7.6159	same	.0356	.2711
3. Typing correspondence	5.000 est			1.00	7.3855	Clk 1 Hillig	.0316	.2334
UNION CARD CATALOG MAINTENANCE								
4. Sorting cards by first letter	0.051			1.20	0.0904	Clk 1 Heilemann	.0361	.0033
5. Sorting cards by date	0.099			1.20	0.1755	same	.0361	.0063
6. Alphabetizing cards from pre-file for blending	0.093			1.25	0.1717	Clk 1 Dyes	.0282	.0048
7. Blending into 1956+ supplementary file	0.306			1.00	0.4520	Clk 1 Wilson	.0219	.0099
8. Blending into 1966+ supplementary file	0.311			1.25	0.5742	same	.0219	.0126
9. Filing into basic 1966+ file	0.469			1.15	0.7967	Clk 1 Chacon	.0344	.0274

+ Standardizing Factor: 1.4771 ; Col. e is to read as this standardizing factor for each activity.

LABOR (L)
UNIT COST CALCULATION FOR BIBLIOGRAPHICAL CENTER ACTIVITIES
WITHOUT THE FREQUENCY PERCENTAGES

Code	ACTIVITY DESCRIPTION	a Observed Mean Time	b Frequency	c Adjusted Time	d Personal Rating Factor	e f Standard Time	g Category of Worker	h W Wage/Min.	i Cost of Activity
10.	Coding	0.155			1.25	0.2862	Clk 1 Sanchez	.0274 .C	.0078
	RECEIPT AND PRE-PROCESSING OF REQUESTS								
11.	Colorado System TWX requests	1.367			1.00	2.0192	Clk 1 Sanchez	.0346 .A	.0699
12.	All other TWX and mail requests	0.933			1.00	1.3781	same	.0346	.0479
13.	Telephone requests	0.511			1.00	0.7548	same	.0346	.0261
	SEARCHING								
* 14.	Searching TWX requests from Colorado Systems Libraries in pre-1956 file	6.841			1.00	10.1048	LA 2 Nichols	.0461	.4658
* 15.	Searching TWX requests from Colorado Systems Libraries in 1956+ files	1.879			1.00	2.7755	same	.0461	.1280
* 16.	Searching TWX requests from Colorado Systems libraries in 1966+ files	2.413			1.00	3.5642	same	.0461	.1643

+ Standardizing Factor: 1.4771; Col. e above is to read as this standardizing factor for each activity.
* Means searching cost for * 14-16 is $.2527

LABOR (L)
UNIT COST CALCULATION FOR BIBLIOGRAPHICAL CENTER ACTIVITIES
WITHOUT THE FREQUENCY PERCENTAGES

	ACTIVITY DESCRIPTION Code	a Observed Mean Time	b Frequency	c Adjusted Time	d Personal Rating Factor	e+ f Standard Time	g Category of Worker	h W Wage/Min.	i Cost of Activity
	17. Searching other requests in pre-1956 files	3.079			1.10	5.0028	**	.0646	.3232
***	18. Searching other requests in 1956+ files	2.597			1.10	4.2196	**	.0646	.2726
***	19. Searching other requests in 1966+ files	1.827			1.10	2.9685	**	.0646	.1918
***	20. Problem searches	14.253			1.00	21.0531	Dir. Hayes	.1078	2.2695
	PROCESSING REQUESTS								
	21. Arranges loan on mail requests or provides location information, or both	7.424			0.90	9.8694	Clk 3 Aranda	.0442	.4362
	22. Circularizing TWX requests	9.284			0.90	12.3421	same	.0442	.5455

+ Standardizing Factor: 1.4771; Col. e above is to read as this standardizing factor for each activity.
** Searching is performed by three persons
*** Means searching cost for No. 18-20 is $ .2625

LABOR (L)
UNIT COST CALCULATION FOR BIBLIOGRAPHICAL CENTER ACTIVITIES
WITHOUT THE FREQUENCY PERCENTAGES

ACTIVITY DESCRIPTION Code	a Observed Mean Time	b Frequency	c Adjusted Time	d Personal Rating Factor	e+ f Standard Time	g Category of Worker	h W Wage/ Min.	i Cost of Activity
POST-PROCESSING OF REQUESTS & MAKING REPLIES								
23. Colorado System TWX replies	2.719			1.00	4.0162	Clk 3 Sanchez	.0346 A.	.1390
24. L.C. circularizing requests	4.675			1.00	6.9054	same	.0346	.2389
25. Other TWX replies	2.263			1.00	3.3427	same	.0346	.1157
26. Mail answers	1.807			1.00	2.6691	same	.0346	.0924
27. Clearing	0.822			1.00	1.2142	same	.0346	.0420
28. Statistics (preliminary to billing)	0.592			1.00	.8744	same	.0346	.0303
MISCELLANEOUS								
29. Telephone calls	6.000 est			1.00	8.8626	***	.0646	.5725

+ Standardizing Factor: 1.4771 ; Col. e above is to read as this standardizing factor for each activity.
** Weighted wage rate for searching

T.R.H. - Total Requests Handled in 1968 - 20866

TABLE III

FREQUENCY CALCULATIONS ON ACTIVITIES

ACTIVITY DESCRIPTION Code	FREQUENCY RATIO	STATISTICS UTILIZED	FREQUENCY PERCENTAGE (100 o/o= 1.00)
ADMINISTRATION			
1. Preparing invoices	Invoices prepared/T.R.H.	500(est.)/20866	.024
2. Calculating payroll; paying bills	Checks prepared/T.R.H.	490 / 20866	.024
3. Typing correspondence	Letters typed / T.R.H.	1300 / 20866	.062
UNION CARD CATALOG MAINTENANCE			
4. Sorting cards by first letter	New cards received / T.R.H.	688095 / 20866	32.977
5. Sorting cards by date	New cards received / T.R.H.	688095 / 20866	32.977
6. Alphabetizing cards from pre-file for blending	New cards received / T.R.H.	688095 / 20866	32.977
7. Blending into 1956+ supplementary file	1956+ Supplementary File / T.R.H.	270550 / 20866	12.966
8. Blending into 1966+ supplementary file	1966+ Supplementary File / T.R.H.	45800 / 20866	2.195
9. Filing into basic 1966+ file	1966+ Basic File / T.R.H.	84000 / 20866	4.026

FREQUENCY CALCULATIONS ON ACTIVITIES
(cont.)

ACTIVITY DESCRIPTION Code	FREQUENCY RATIO	STATISTICS UTILIZED	FREQUENCY PERCENTAGE (100 o/o = 1.00)
10. Coding	New cards handled / T.R.H.	688095 / 20866	32.977
RECEIPT AND PRE-PROCESSING OF REQUESTS			
11. Colorado System TWX requests	*o/o of TWX'd Colo. System requests X total Colo. requests / T.R.H.	$\frac{23.0 \times 11869}{20866}$	0.131
12. All other TWX and mail requests	**Other TWX'd and mail requests/T.R.H.	$\frac{17183}{20866}$	0.824
13. Telephone requests	* o/o of telephoned requests X T.R.H. / T.R.H.	$\frac{4.6 \times 20866}{20866}$	0.046
SEARCHING			
14. Searching TWX requests from Colorado System Libraries in pre-1956 file	* o/o of pre-1956 X *est. Colo. TWX requests X total Colo. requests/T.R.H.	$\frac{48.0 \times 2723}{20866}$	0.063
15. Searching TWX requests from Colorado Systems Libraries in 1956+ files	* o/o of 1956+ req. X *est. Colo. TWX reqts. X total Colo. requests / T.R.H.	$\frac{33.6 \times 2723}{20866}$	0.044
16. Searching TWX requests from Colorado Systems Libraries in 1966+ files	* o/o of 1966+ req. X *est. Colo. TWX reqts. X total Colo. requests / T.R.H.	$\frac{17.1 \times 2723}{20866}$	0.022

*Derived from sampling 1968 request file.
**Other TWX and mail requests

TOTAL REQUESTS	20866	TOTAL OTHER REQUESTS	18143
COLORADO SYSTEM TWX REQUESTS	- 2723	TELEPHONE REQS.	- 960
TOTAL OTHER REQUESTS	18143		17183

FREQUENCY CALCULATIONS ON ACTIVITIES
(cont.)

ACTIVITY DESCRIPTION Code	FREQUENCY RATIO	STATISTICS UTILIZED	FREQUENCY PERCENTAGE (100 o/o - 1.00)
17. Searching other requests in pre-1956 files	*o/o of pre-1956 requests X**total other requests / T.R.H.	$\frac{48.0 \times 18143}{20866}$	0.417
18. Searching other requests in 1956+ files	*o/o of 1956+ requests X**total other requests / T.R.H.	$\frac{33.6 \times 18143}{20866}$	0.292
19. Searching other requests in 1966+ files	* o/o of 1966+ requests X**total other requests / T.R.H.	$\frac{17.1 \times 18143}{20866}$	0.149
20. Problem searches	* o/o of problem requests X grand total requests / T.R.H.	$\frac{8.7 \times 20866}{20866}$	0.087
PROCESSING REQUESTS			
21. Arranges loan on mail requests	* o/o of contract mail requests X grand total requests / T.R.H.	$\frac{83.2 \times 20866}{20866}$	0.832
22. Circularizing TWX requests	* o/o of circularized requests X grand total requests / T.R.H.	$\frac{0.838 \times 20866}{20866}$	0.008

* Derived from sampling 1968 request file.
** Other requests.

Colorado (other) 11869-2723	9146
Regional & other than regional	8997
TOTAL	18143

FREQUENCY CALCULATIONS ON ACTIVITIES
(cont.)

ACTIVITY DESCRIPTION Code	FREQUENCY RATIO	STATISTICS UTILIZED	FREQUENCY PERCENTAGE (100 o/o - 1.00)
POST-PROCESSING OF REQUESTS & MAKING REPLIES			
23. Colorado System TWX replies	* o/o of TWX'd Colo. System requests X total Colo. requests / T.R.H.	$\frac{23.0 \times 11869}{20866}$	0.131
24. L.C. Circularizing requests	* o/o of requests circularized X T.R.H. / T.R.H.	$\frac{0.838 \times 20866}{20866}$	0.008
25. Other TWX replies	* o/o of other requests TWX'd X total other requests / T.R.H.	$\frac{14.6 \times 18143}{20866}$	0.126
26. Mail answers	* o/o of contracts and locations X T.R.H. / T.R.H.	$\frac{91.5 \times 20866}{20866}$	0.915
27. Clearing	T.R.H. / T.R.H. - 1.00		1.000
28. Statistics and preliminary billing	1.00		1.000
MISCELLANEOUS			
29. Telephone calls	0.10 (estimated)		0.100

*Derived from sampling 1968 request file.

TABLE IV

FREQUENCY DATA
(Drawn from Sample of 1968 Requests)

Problem Searches - 89
Circularized - 10

Request Characteristics	Public	College & Univ.	State	Federal	Special	School	Total	Percent
Imprint:								
No-date	7	7	0	0	2	0	16	1.3
1966+	124	38	18	2	20	2	204	17.1
1956-65	196	133	39	9	21	3	401	33.6
pre-1956	179	309	55	13	14	3	573	48.0
Total	506	487	112	24	57	8	1194*	
Percent	42.3	40.8	9.4	2.0	4.8	0.7		100.0
Verification:								
a. yes	298	159	53	2	21	7	540	48.5
b. Yes,with NUC	141	176	31	10	3	0	361	32.4
c. no	51	100	22	10	29	1	213	19.1
d. B.C. verified in NUC	68	62	20	9	17	0	176	(15.8)
e. B.C. could not verify	7	12	4	2	1	0	26	(2.3)
Total of a,b,c.	490	435	106	22	53	8	1114*	100.0
Percent	44.0	39.0	9.5	2.0	4.8	0.7	100.0	
Form of Input:								
Contract: I.L.L. Arranged	273	301	39	2	32	5	652	55.0
TWX + Contract	108	2	0	0	7	2	119	10.0
TWX	62	43	35	0	2	1	136	11.5
Card (telephone)	9	15	4	2	23	1	54	4.6
Letter/Memo	1	18	0	0	2	0	28	2.4
I.L.L. Form	68	106	9	0	11	0	196	16.5
Total	521	486	87	4	77	9	1184*	
Percent	44.0	41.0	7.4	0.3	6.5	0.8		100.0

Percent Problem Searches - 89/1194 - 7.4

Percent Circularized - 10/1194 - 0.838

Percent Problem Searches - 7.4
Percent of No-Date Reqts - 1.3
Total Problem Searches 8.7

* On some requests sampled the specific category of data being tabulated was missing. Therefore, the totals are not the same.

TABLE V

FREQUENCY DATA BY FORM OF INPUT
1968 REQUESTS

	Colorado Requests (System)	Colorado Requests (Other)	Regional Requests	Total *
Contract	183	163	273	619
TWX + Contract	132	6	0	138
TWX	31	9	105	145
Card(Telephone)	11	41	3	55
Letter or Memo	2	8	11	21
ILL Form/Location Only	58	65	92	215
Total	417	292	484	1,193

* These totals do not match the totals for Form of Input on TABLE IV. These figures were tabulated by two persons working independently. Apparently they interpreted some requests differently. However, TABLE V was used as the basis for all frequency percentages pertaining to form of input in the cost study.

TABLE VI

CATEGORIES OF REFERRAL, 1968 REQUESTS

MONTH	LOCATIONS		LOANS		OTHER*	TOTAL
	Regional	Outside	Regional	Outside		
Jan.	253	256	931	89	90	1619
Feb.	198	321	1001	62	117	1699
Mar.	422	338	1001	105	133	1999
Apr.	181	302	905	95	108	1591
May	195	279	756	62	139	1431
June	174	183	691	58	93	1199
July	271	304	947	84	96	1702
Aug.	227	254	891	72	98	1542
Sept.	285	289	977	57	131	1739
Oct.	378	393	1573	59	141	2544
Nov.	330	379	1248	33	164	2154
Dec.	252	258	1019	39	93	1661
TOTALS	3160	3556	11941	815	1403	20875**

	Col. 1	Col. 2		Col. 3	Col. 4
		BREAKDOWN FROM OTHER			
	Req. Circularized	Results			No Locations
		Locs. Regional		Locs. Outside	
Jan.	38	4		14	20
Feb.	41	5		25	11
Mar.	31	3		21	7
Apr.	36	2		21	13
May	45	3		31	11
June	36	3		22	11
July	54	5		30	19
Aug.	31	4		10	17
Sept.	49	4		21	24
Oct.	21	6		6	9
Nov.	18	6		9	3
Dec.	11	-		10	1
TOTAL	411	45		220	146

BREAKDOWN FROM OTHER
(cont.)

Total requests satisfied with regional action:	15,146	
Total action outside the region:	4,591	
Total not located after circularizing:	146	
Total other	1,403	
After breakdown, Cols. 2&3 under table Breakdown From Other transferred to above categories.	- 265	
	1,138	
Totals		
Regional Locs/Loans	72.55 o/o	- 94.54 o/o
Outside Locs/Loans	21.99 o/o	
No Locs after circ.	.07 o/o	
Other	5.45 o/o	
	100.06 o/o	

* Other: Trade bibl. (could be counted as +)
Not able to verify
Need further information
Too new - no locations
No regional locations - not sent outside region
(After cols. 1-4, under table Breakdown From Other subtracted.)

** Discrepency between this figure and total number of requests of 20866 has not been rechecked.

TABLE VII

EMPLOYEE ROSTER

Permanent Employees 1968

Employee[1] (Function)	Position	Salary: Earned Annual	Salary: Hourly	Allowed Hours: Sick Leave	Allowed Hours: Vacation[2]	Used Hours: Sick Leave	Used Hours: Vacation	Added Hours Off[3]
M.Alcaro(9-17-68) (1/2time)(Acctg.)	Clerk-Typist II	$ 598.50	$1.98	14	21 1/2	12	0	4
(Search&Process req.) B.Aranda	Clerk III	4908.00	2.36	96	168	0	112	8
E.Behrendt (7/8 time) (out)	Librarian I (8 mos.) Librarian II (4 mos.)	3850.72 2012.48	3.18 3.32	84	136	21[6]	94	7
(Filer & TWX relief) F. Chacon	Clerk I (6 mos.) Clerk I (6 mos.)	1794.00 1836.00	1.73 1.77	96	144	40[6]	120	8
I.Dibble[7] (Search) (60 hrs.p.mo.)	Lib.Asst. II	1680.00	2.33	--	--	--	--	--
(Search& file supr.) L.Durzo[8]	Librarian III	8244.00	3.97	96	168	8	144	8
P.Hayes[8]	Director	12000.00	5.78	96	144	5[6]	104	8
(Filer) A.Heilemann	Clerk I	3840.00	1.85	96	144	64 1/2	131	8
(Sec'y & relief process) L.Hillig (8-26-68)	Clerk-Steno I	1360.00	1.85	32	56	0	8	8
(Filer) C.Sanchez (Hrly.) (8-15-68)	Clerk I	1629.56	1.69	--	--	--	--	--
(Search) S.Nichols (6-9-68)	Lib.Asst. I	1642.50	2.53	30	62 1/2	33 1/2	8	
A.Sanchez (TWX & some process)	Clerk I (6 mos) (2 mos) Clerk Typist I (4 mos)	1714.10 535.50 1280.00	1.73 1.77 1.85	89 1/2	134	136[6]	85	8
C.Towle (resigned)	Clerk Typist II (8 mos)	2674.49	2.02	64	83	66	104	--
(Filers) H.Winter (Replaced by Dyes&C.Wilson in 1969.)	Clerk I (3 1/2 mos)	732.50	1.69	20	33	28 1/2	8	--

Permanent Employees 1968
(cont.)

Hrs. Off Without Pay[4]	Bib. Center Retirement Contribution[5]	Mos. Employed	Total Off. Hrs. Empl. at 176 Hrs. per mo.	Total Unproductive Hrs.	Tot. Actual Hrs. Worked	Ann. Earnings plus Benefits	Actual Hrly. Wage	Actual Wage p. Min.
						$	$	$
--	--	1.75	308.0	28	280.0	$ 598.50	$2.138	.0356
--	$245.52	12.0	2112.0	168	1944	5153.52	2.651	.0442
--	293.12	7.0 3.5	1232.0 616.0 1848.0	170	1668	6156.32	3.751	.0625
--	181.56	6.0 6.0	1056.0 1056.0 2112.0	216	1896	3811.56	2.063	.0344
--	--	2.73	480.5		480.5	1680.00	3.496	.0583
--	412.32	12.0	2112.0	208	1904	8656.32	4.541	.0757
--	600.00	12.0	2112.0	165	1947	12600.00	6.471	.1078
--	192.00	12.0	2112.0	251.5	1860.5	4032.00	2.167	.0361
--	--	4.25	748.0	40	718.0	1360.00	1.894	.0316
152	--	6.5	1144.0	152	992	1629.56	1.643	.0274
--	--	3.75	660.0	66.5	593.5	1642.50	2.767	.0461
46 1/2	184.36	6.0 2.0 4.0	1056.0 352.0 [illegible]	323.5	1788.5	3713.96	2.077	.0346
86 1/2	--	8.0	1408.0	218	1190	2674.49	2.247	.0374
--	--	3.5	616.0	60.5	555.5	732.50	1.315	.0219

Footnotes on page 56

Temporary or Intermittent Employees

Employee[1]	Position	Salary		Allowed Hours		Used Hours		Added Hours Off[3]
		Earned Annual	Hourly	Sick Leave	Vacation[2]	Sick Leave	Vacation	
J. Apodaca	Clerk 1 2 mos.	$671.56	$1.69	--	--	--	--	--
H. Call	Clerk Steno II, (152 hrs.)	351.34	2.22	--	--	--	--	--
C. Dyes	Clerk 1 (54 hrs.)	91.26	1.69	--	--	--	--	--
L. Yowell	Clerk 1 (201 hrs.)	390.39	1.69	--	--	--	--	--
Employers Overload	Clerk Steno II (275 hrs.)	739.36	2.69	--	--	--	--	--
GRAND TOTAL	(12.625 F.T.E.)[10] (10.34 hours of part-time help)	$54,576.26						

Neighborhood Youth Corp Workers
(Not paid by Bibliographical Center)

D. Grine	Clerk 1 (448 hrs.)	--	--	--	--	--	--	--
A. Trujillo	Clerk 1 (24 hrs.)	--	--	--	--	--	--	--
M. Trujillo	Clerk 1 (83 1/2 hrs.)	--	--	--	--	--	--	--
H. Williams	Clerk 1 (32 1/2 hrs.)	--	--	--	--	--	--	--
TOTAL	588 hours							

Footnotes on Page 56

Hrs. Off Without Pay[4]	Bib. Center Retirement Contribution[5]	Mos. Employed	Total Off Hrs. Empl. at 176 Hrs. per mo.	Total Unproductive Hrs.	Tot. Actual Hrs. Worked	Ann. Earnings plus Benefits	Act. Gal Hrly. Wage	Act. Gal Wage P. Min.
120	--	2.0	352.0	--	352.0	671.56	1.908	.0318
--	--	--	152.0	--	152.0	351.34	2.311	.0385
--	--	--	54.0	--	54.0	91.26	1.690	.0282
--	--	--	201.0	--	201.0	390.39	1.445	.0241
--	--	--	275.0	--	275.0	739.36	2.689	.0448
		114.98	21008.5	2665.5	18851.5	$56685.14		
Neighborhood Youth Corp Workers (Not paid by Bibliographical Center)								
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--

Permanent Employees 1968
(cont.)

Footnotes

1. Date of employment; all other permanent employees as of January 1, 1968.

2. Vacation credit includes compensatory credit for three holidays worked, but does not show credit balances transferred from 1967.

3. Time off given preceding Christmas and New Year's.

4. For Sanchez and Towle taken due to exhaustion of vacation allowances. For Leyva (Sanchez) and Apodaca time off payroll represents hours expected to work, but which were not worked. All time assumed to be equivalent to loss time to employer.

5. Employees are eligible for retirement coverage after one year.

6. Estimated sick leave for individuals shown. Some 1968 time sheets were destroyed and calculations made from best records available. We believe they are very nearly accurate.

7. Dibble is a long-time employee on retirement status earning maximum Social Security allowance.

8. Durzo and Hayes have worked uncounted hours of overtime.

9. There were six holidays (legal); i.e. 48 hours.

10. 12.625 full time equivalent employees are listed on the roster; however, not all of them were employed at the same time.

TABLE VIII

TRANSPORTATION (T)

FLOW PROCESS CHART	TOTAL FEET	EMPLOYEES UTILIZED	BATCH FACTOR	WAGE RATE	UNIT DISTANCE	RAW TIME AT 241.2 FT.P.MIN.	UNIT TRANSPOR-TATION COS
ADMINISTRATION SERVICES:							
Secretarial	1204	Hillig	10	.0316	120.4	0.499	.0158
Bookkeeping	650	Alcaro	10	.0356	65.0	0.268	.0095
FILING IN UNION CATALOG:							
	150	Heilemann	1	.0361	150	0.622	.0224
	150	Dyes	1	.0282	150	0.622	.0175
	150	Wilson	1	.0219	150	0.622	.0136
	150	Chacon	1	.0344	150	0.622	.0214
	150	Sanchez,C.	1	.0274	150	0.622	.0170
REQUEST HANDLING:							
Pre-processing	81	Sanchez,A.	40	.0346	2.025	0.008	.0003
Searching	1527	Durzo	10	.0757	152.7	0.633	.0479
	1527	Nichols	10	.0461	152.7	0.633	.0292
	1527	Dibble	10	.0583	152.7	0.633	.0369
	1527	Hayes	10	.1078	152.7	0.633	.0682
Processing	72	Aranda	40	.0442	1.800	0.008	.0004
Post-Processing	116	Sanchez, A.	40	.0346	2.900	0.012	.0004
TOTAL:							.3005

TABLE IX *

UNIT COSTS

SUPPLIES COST (S)

Total Supplies Expense	Total Requests Handled	Unit Supply Cost
$1,099.77	20,866	$ .0527

EQUIPMENT OVERHEAD (O_e)

O_c Contractual Services	O_d Depreciation	$O_c + O_d$ O_e Total Equipment Overhead
$6,119.94	$1,053.24	$7,173.18

Square Footage Occupied	O_i Rental Charged Per Annum	Institutional Overhead per square foot
2,400	$2,400.00	$1.00

UNIT OVERHEAD COST (O)

O_a Administrative	O_e Equipment	O_i Institutional	O_t TOTAL	O Unit Cost
$16,189.31	$7,173.18	$2,400.00	$25,762.49	$1.2347

SUMMARY OF UNIT COSTS (C)

Labor (L)	Overhead (O)	Supplied (S)	Transportation (T)	Total (C)
$2.1828	$1.2347	$.0527	$.3005	$ 3.7707

Total Requests in 1968	Unit Cost	Operating Total Cost (by analysis)	Total Operating Cost (by auditors' report)
20,866	$3.7707	$78,679.47	$78,374.65

* See APPENDIX VII for an itemization of the components of supplies and overhead totals.

59-60-61-62

SUPPLIES COST (S)

Stationery and supplies	$ 960.72
Catalog cards	139.05
TOTAL	$ 1099.77

EQUIPMENT OVERHEAD(Oe)

Contractual Services (Oc):	
Postage	$ 584.18
Teletype	2993 .73
Repair on equipment	56.50
Telephone	139.02
Printing & publications	49.62
Insurance	601.92
Bibliographies	1384.97
Professional fees	310.00
TOTAL	$ 6119.94

ADMINISTRATIVE OVERHEAD (Oa)

Travel:	
Director & staff	$ 1633.95
Board members	384.75
Annual Meeting	21.66
Dues	30.00
Payroll taxes	2131.65
Payroll tax adjustment	395.19
Retirement expense	2108.88
Special Fund	352.27
Miscellaneous expense	130.96
TOTAL	$ 7189.31
Director Activities (other than searching & supervising) (75 o/o)	$ 9000.00
TOTAL	$16189.31

FORM I

SAMPLE DATA COLLECTION SHEET

Investigator & date _____

_____

Request # _____

Imprint Date _____

Verification Status:

____ yes; ____ in NUC

____ no

____ Bib. Center verified in NUC

____ Bib. Center could not verify

____ Searcher's initials

Location code _____

Subject Emphasis:

____ Social Sci.

____ Humanities

____ Sci./Tech.

____ Bibliog.

Handling dates:

____ Date of origin

____ Date of receipt at Bib. Center

____ Date reported to origin

____ Date queried at NUC

____ Date NUC replied

____ Date (specify) _____

____ Date (specify) _____

Time Lags

1) _____

2) _____

3) _____

4) _____

5) _____

6) _____

Type of Library:

____ Public

____ College & Univ.

____ State

____ Federal

____ Special

____ CoDB

Form of Material:

____ Monograph

____ Serial

____ Phonodisc

____ Music score

____ Other (specify) _____

____ Filmstrip

____ Movie Film, 16mm

____ Movie Film, 8mm

____ Tape Recording

. . . . . .

FORM II

BIBLIOGRAPHICAL CENTER INPUT 1968

Tabulated by_____

Request Characteristics	Public	College &Univ.	State	Federal	Special	School	Totals
A. IMPRINT:							
n.d.							
1966+							
1956-65							
pre-1956							
TOTALS							
B. VERIFICATION STATUS:							
yes(if in NUC asterisk)							
no							
Bib.Ctr. verified in NUC							
Bib.Ctr. could not verify							
TOTALS							
C. SUBJECT EMPHASIS:							
Social Sci.							
Humanities							
Sci. / Tech.							
Bibliog.							
TOTALS							
D. FORM OF MATERIAL							
Monograph							
Serial							
Phonodisc							
Music Score							
Filmstrip							
Movie, 16mm							
Movie, 8mm							
Tape Recording							
Other							
TOTALS							

BIBLIOGRAPHICAL CENTER INPUT 1968

Tabulated by_____

Az Ariz	C Calif	Co Colo	Id Idaho	Ia Iowa	K Kan	Mo Misso	Nb Neb.	Nv Nev.	Nm N. Mex	Nd N. Dak	Sd S. Dak	Tx Tex	U Utah	Wy Wyo	Total

BIBLIOGRAPHICAL CENTER INPUT 1968

Tabulated by_____

Request Characteristics	Public	College & Univ.	State	Federal	Special	School	Totals
E. FORMAT OF REQUEST:							
Contract (blue)							
Orig. TWX							
TWX							
Card Form							
Letter							
Blue (Location)							
TOTALS							

F. SEARCHERS:	
PH	
ID	
EB	
LD	
BA	
CT	
None	
TOTALS	

CIRCULARIZING:_____

BIBLIOGRAPHICAL CENTER INPUT 1968

Tabulated by_____

Received Location

Outside of Region	Regional	DLC Only	No Regional Locations	No Locations	Receiver Colo.

BIBLIOGRAPHICAL CENTER SERVICE, 1968

Tabulated by_____

State	Public	College & Univ.	State	Federal	Special	School	Totals	
G.								
Az Arizona								
C California								
Co Colorado								
Id Idaho								
Ia Iowa								
K Kansas								
Mo Missouri								
Nb Nebraska								
Nv Nevada								
Nm New Mexico								
Nd North Dakota								
Ok Oklahoma								
Sd South Dakota								
Tx Texas								
U Utah								
Wy Wyoming								
TOTALS								
H. TIME LAGS:								
1)								
2)								
3)								
4)								
5)								
6)								
TOTALS								

BIBLIOGRAPHICAL CENTER SERVICE, 1968

Tabulated by______________

		TIME LAGS					FORMAT OF REQUEST					
1	2	3	4	5	6	TOTALS	ILL Cont.(blue)	Orig.TWX	TWX	Card Form	Ltr.	Blue (Loc)

APPENDICES C. BACKGROUND DATA

APPENDIX I

30-71-12

BIBLIOGRAPHICAL CENTER STUDY GUIDE LINE

Objectives: Primary:
To do a systems analysis of the operation of the Bibliographic Center.
Secondary:
To provide data upon which a cost analysis can be based and upon which conclusions can be drawn as to the frequency of usage of files, books, and equipment, time lags in the performance of services; and users of these services.

Methods: Interviewing, time observations, work sampling, files sampling, flow process charting, measuring, forms collection, frequency tabulations.

Study Team: Mrs. Joan Maier, Supervisor, Coordinator, Colorado Academic Libraries Book Processing Center
Miss Anna Condit
Mrs. Joan Harrigan
Mr. David Taylor
Miss Marilyn Miller
Mr. Paladugu Rao

NOTE: Be sure to collect forms as you time observe!
*(Study Team only in office assigned)

Tentative Schedule:

Monday July 28	8:00 - 9:00	Joint meeting of Study Team and Bibliographical Center Staff
	9:00 - 10:00	Interviews conducted by team members with supervisors
	10:00 - 10:15	Break
	*10:15 - 11:00	Development of list of operations to be timed and assignment of tasks
	*11:00 - 11:45	Instruction on Time Observation Techniques
	11:45 - 1:00	Lunch
	1:15 - 3:00	Time Observations
	3:00 - 3:15	Break
	3:15 - 5:00	Time Observations
	5:00 - 5:30	Consultation Period
Tuesday July 29	8:00 - 10:00	Time Observations
	10:00 - 10:15	Break
	10:15 - 11:45	Time Observations
	11:45 - 1:00	Lunch
	1:15 - 3:00	Time Observations
	3:00 - 3:45	Break
	3:15 - 5:00	Assistance in Flow Process Charting
	*5:00 - 5:30	Progress Report on Time Observations
Wednesday July 30	*8:00 - 9:00	Sampling Tasks defined and assigned
	*9:00 - 10:00	Sample sizes calculated and tables formated
	10:10 - 10:15	Break
	10:15 - 11:45	Sampling or completion of Time Observations
	11:45 - 1:00	Lunch
	1:15 - 3:00	Sampling
	3:00 - 3:15	Break
	3:15 - 5:00	Sampling
	*5:00 - 5:30	Evaluation of Progress on Time Observations, Flow Process Charting, and Sampling

BIBLIOGRAPHICAL CENTER STUDY GUIDE LINE
(Continued)

Thursday July 31	8:00 - 10:00	Sampling
	10:00 - 10:15	Break
	10:15 - 11:45	Sampling
	11:45 - 1:00	Lunch
	* 1:15 - 2:00	Flow Process Charts and Time Observation Completion
	2:00 - 3:00	Sampling
	3:00 - 3:15	Break
	3:15 - 5:00	Completion of sampling
	5:00 - 5:30	Check period for completion of tasks
Friday August 1	* 8:00 - 10:00	Examination of data collected
	10:00 - 10:15	Break
	*10:15 - 11:45	Conclusions and discussion of design implications
	11:45 - 1:00	Lunch
	* 1:15 - 3:00	Draft of recommendations
	* 3:00 - 3:15	Break
	* 3:15 - 5:00	Explanation of Flow Cost Analysis will be performed
	* 5:00 - 5:30	Final meeting

Supplies: * shared usage

Stop watch and fine line ball point pen or pencil, black lead
Graph paper (¼ inch)
Legal pad, white
Ruler
Red felt marker
Manila folders
*Tape measure
*Tape recorder
Forms:
- Operations to be Timed
- Time Observation Sheet
- Flow Process Chart (2 pages)
- Activities Grid

Suggested Readings about the Bibliographical Center*

"Swank" Survey. 1966. 100pp.
Reports . . . Annual Meeting, 1968.
Assorted Flow Process Charts on interlibrary loan activities.

(* Mrs. Maier will leave these in the Study Team office during the day and will loan them to individuals overnight.)

APPENDIX II

BIBLIOGRAPHICAL CENTER FOR RESEARCH

Primary Objectives

1. To assemble and maintain a union catalog of the resources of member libraries, and of other libraries which would increase and expand the service of a union catalog.

2. To develop a center and a bureau of information for interlibrary loans between member libraries and other libraries in the Rocky Mountain region; also to assist outside libraries to locate western and regional materials in the libraries of this region.

3. To maintain close relationship with the Library of Congress and the National Union Catalog.

4. To further cooperation, to develop coordination of resources utilization, and to maintain research services among institutions of the Rocky Mountain region.

Study Team's Objectives

1. To analyze the operations of the Bibliographical Center as a means of practicing the tools of scientific management.

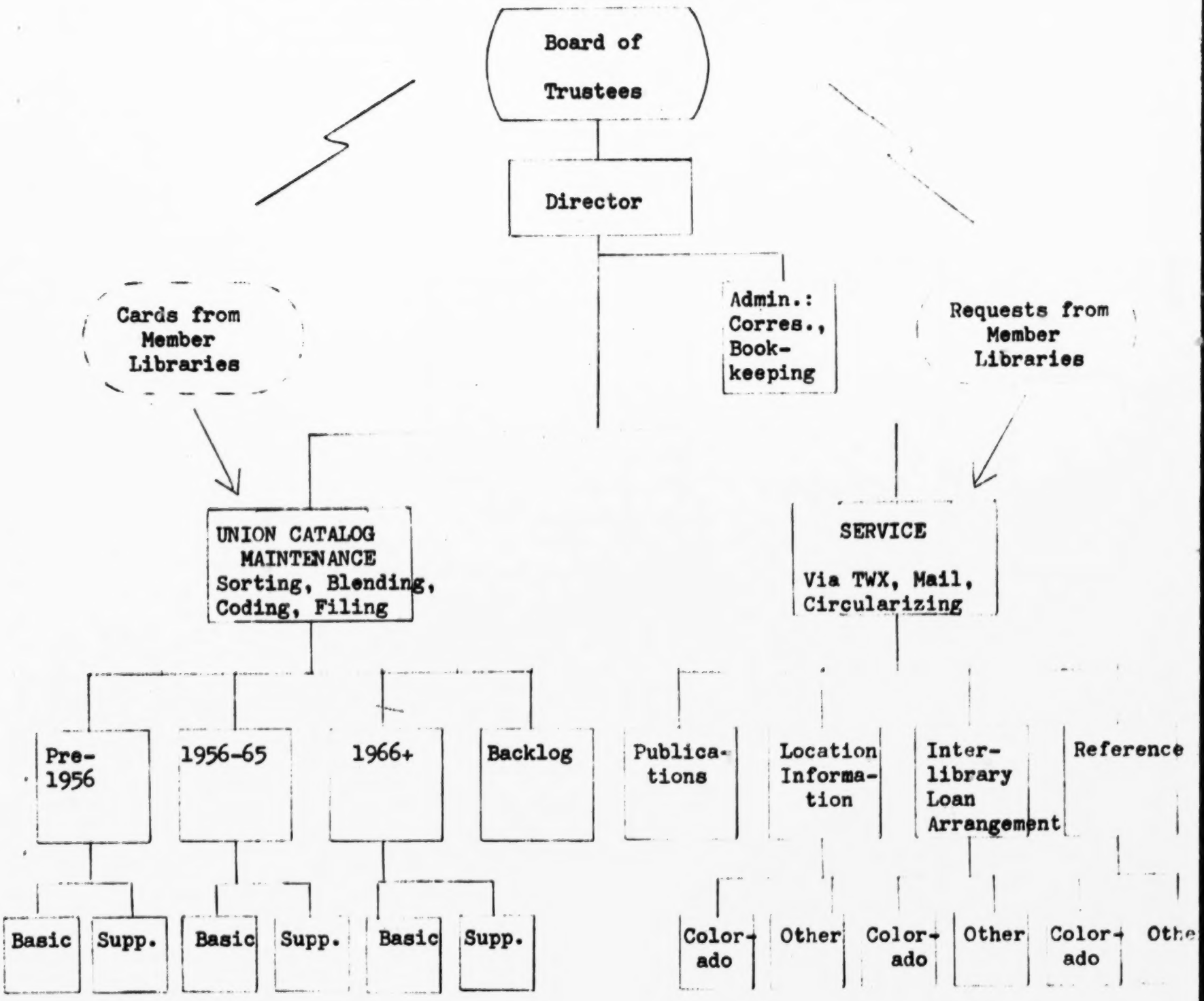
2. To collect data necessary to the preparation of a formal cost analysis and written report of these operations.

Basic Information and Statistics
(as of December 1968)

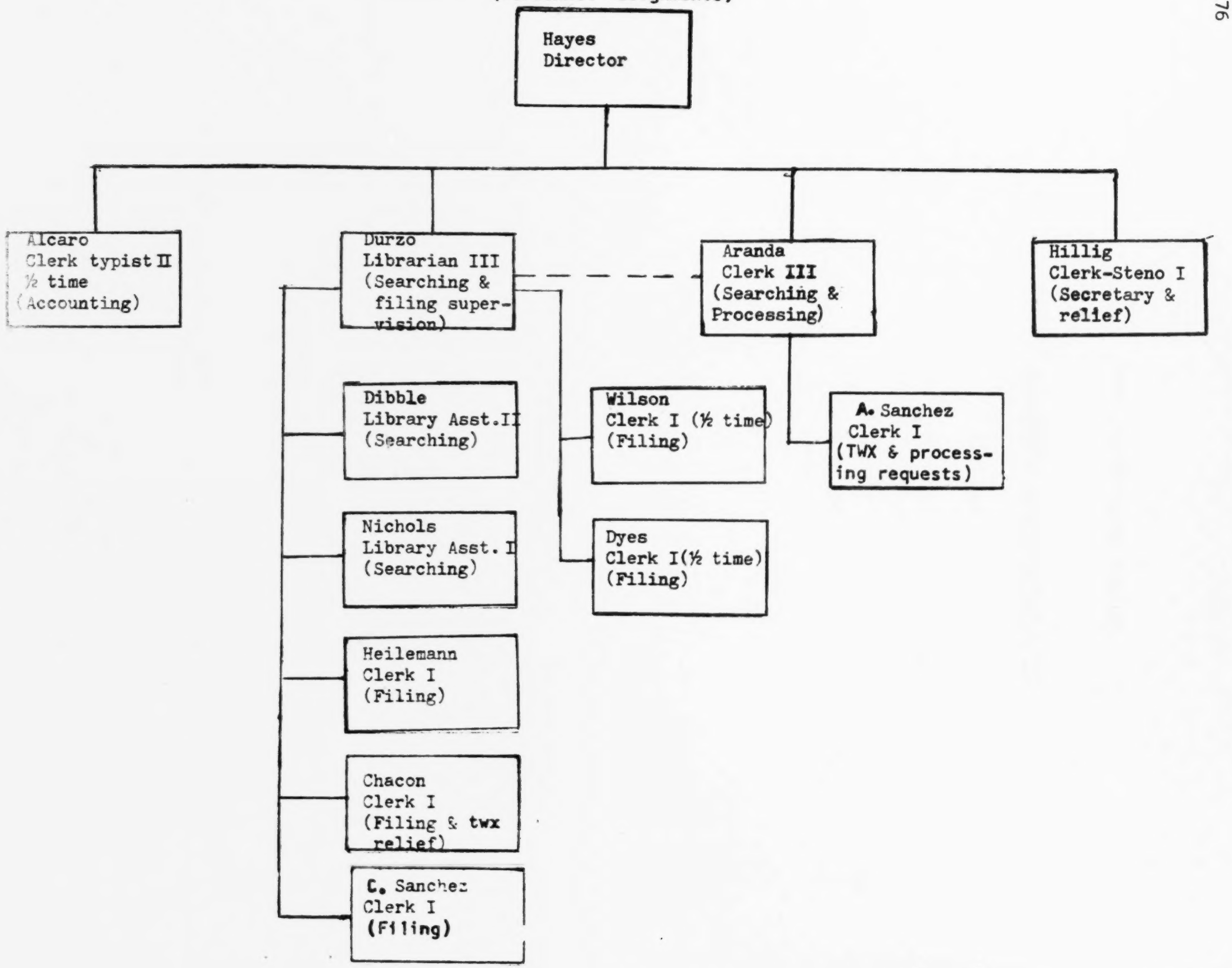
Founded: 1935
Size of Union Catalog: 4,132,993 main entries (est.)
Cards received During 1968: 688,095
Member Libraries: 116 direct members; 377 voting members
States Represented: 15
Size of Staff: 11 (2professionals)
Requests Handled: 20,866
Budget: $79,000
State Contracts: Colorado, Nebraska, South Dakota, Wyoming (68 percent of income comes from "state-wide support" plans; 32 percent comes from "direct-support" members)
Number of Libraries Contributing Cards to the Union Catalog: 66
Board Composition: president, vice president, secretary, treasurer, and five members at large
Surveys: R.C. Swank, 1966, 100pp.; Cost Analysis (in progress), Joan M. Maier; Services Survey (in progress), Genevieve Casey.

APPENDIX III

PRESENT ORGANIZATION CHART



APPENDIX IV
BIBLIOGRAPHICAL CENTER ORGANIZATION CHART
(Personnel Assignments)



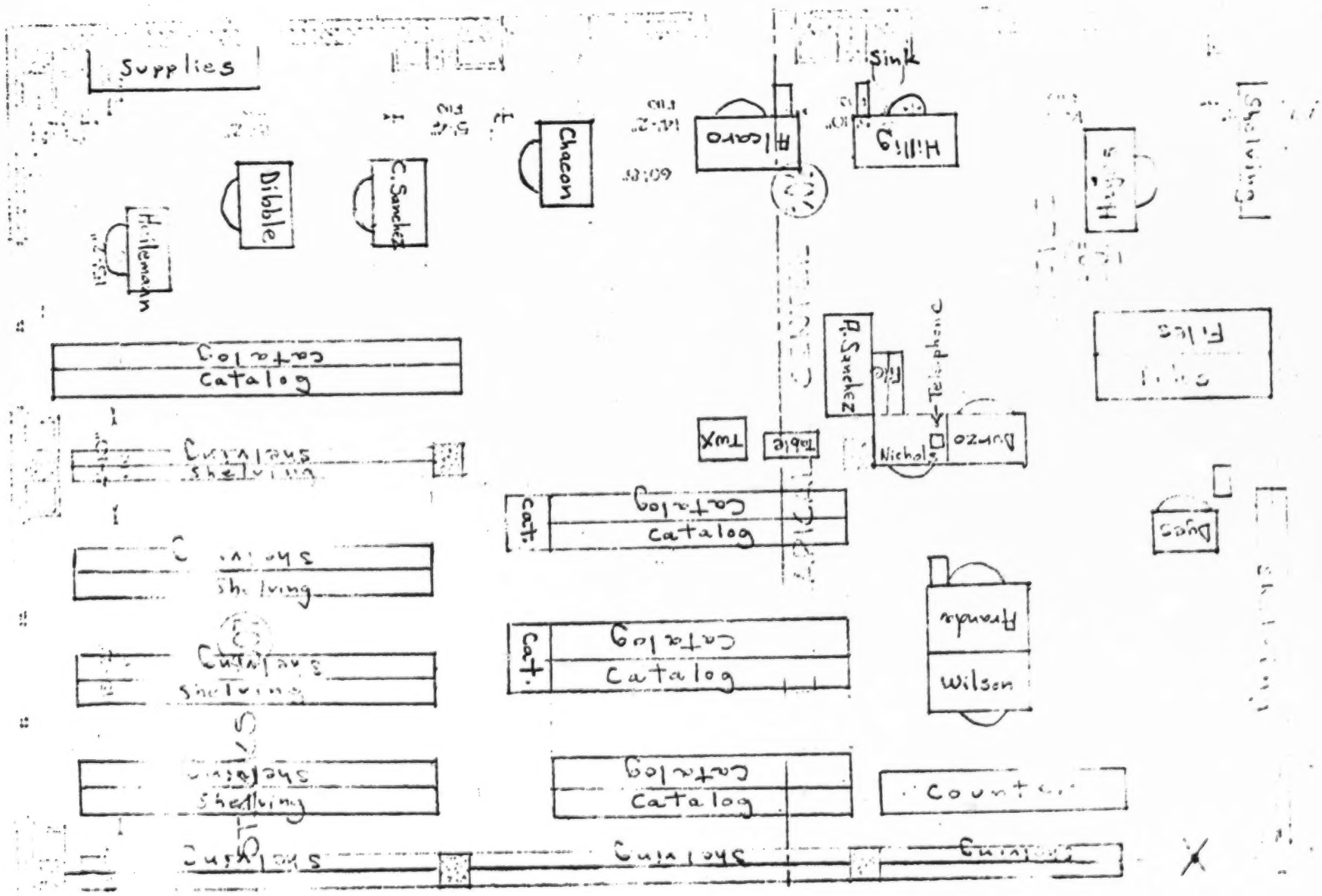
APPENDIX V
BIBLIOGRAPHICAL CENTER OPERATIONS OUTLINE

Primary Functions	Analyst	Personnel	Operations
Maintenance	Paladugu Rao	Heilemann Chacon Wilson Dyes Sanchez, C.	Incoming requests Filing pre-1956 and 1956-65 Filing pre-1956 1966 blending Location coding
Service:			
Input	Marilyn Miller		
TWX		Sanchez, A. & Chacon*	
Mail		Heilemann	
Telephone		Durzo, Nichols, Aranda	
Manipulation			
Pre-processing	Marilyn Miller	Sanchez, A.	
Searching	Joan Harrigan	Durzo	Supervision and searching
		Dibble	Searching requests
		Nichols	Searching Colorado requests
		Heilemann*	Simple searching
		Aranda*	Searching
		Hayes*	Searching
Post-processing	David Taylor	Aranda & Hillig*	
Output	Marilyn Miller		
TWX		Sanchez, A.	
Mail		Sanchez, A.	
Telephone		Durzo, Nichols	
Administration	Anna Condit		
Supervision		Hayes	
Secretarial		Hillig	
Accounting		Alcaro	
Statistics		Sanchez, A. & Heilemann	

*some of the time

APPENDIX VI

FLOOR PLAN OF THE BIBLIOGRAPHICAL CENTER FOR RESEARCH
L.S.I., 7-31-69



Scale: 1/8 inch = 1 foot

APPENDIX VII

BIBLIOGRAPHICAL CENTER FOR RESEARCH,
ROCKY MOUNTAIN REGION, INCORPORATED

Statement of Cash Receipts and Disbursements
For the Year Ended December 31, 1968

	Actual*	Budget	Actual Over (Under) Budgeted
Receipts:			
Members' and request service charges:			
Public libraries	$ 1,795.00	$ 1,990.00	$(195.00)
Colleges and Universities	17,255.50	17,925.00	(669.50)
State library agencies	52,536.00	64,470.00	(11,934.00)
Mountain-Plains Library Association	1,000.00	1,000.00	-0-
Federal agencies	798.50	550.00	248.50
Businesses	1,806.00	1,376.00	430.00
Non-profit organizations	219.00	530.00	(311.00)
Individuals	5.00	-0-	5.00
Sale of bibliographies	280.00	120.00	160.00
Denver Public Library - special fund	1,950.00	2,600.00	(650.00)
Total Receipts	77,645.00	90,561.00	(12,916.00)
KEY* Disbursements:			
L Salaries - gross	54,576.66	57,599.00	(3,022.34)
S Stationery and supplies	960.72	400.00	560.72
Oc Postage	584.18	700.00	(115.82)
Oc Teletype	2,993.73	3,000.00	(6.27)
~~Binding~~	-0-	200.00	(200.00)
Oa Travel - directors and staff	1,633.95	2,500.00	(866.05)
Oa Travel - board members	384.75	1,600.00	(1,215.25)
Od Equipment	7,779.35	9,000.00	(1,220.65)
Oc Equipment repair	56.50	200.00	(143.50)
Oi Rent and maintenance	2,400.00	2,400.00	-0-
~~Oehlerts Bibliographies~~	-0-	-0-	-0-
Oc Telephone	139.02	200.00	(60.98)
Oc Printing and publications	49.62	600.00	(550.38)
Oa Annual meeting	21.66	200.00	(178.34)
Oa Dues	30.00	25.00	5.00
L Payroll taxes	2,131.65	2,256.96	(125.31)
L Adjustment for payment of payroll taxes and withholdings in subsequent years - Note 1	(395.19)	-0-	(395.19)
L Retirement expense	2,108.88	2,117.15	(8.27)
Oc Insurance	601.92	750.00	(148.08)
~~Survey expense~~	-0-	-0-	-0-
Oc Bibliographies	1,384.97	3,000.00	(1,615.03)
S Catalog cards	139.05	125.00	14.05
Oa Professional fees	310.00	425.00	(115.00)
Oa Special fund expense	352.27	2,600.00	(2,247.73)
Oa Miscellaneous expense	130.96	50.00	80.96
Total Disbursements	78,374.65	89,948.11	(11,573.46)
Deficit of Cash Receipts over Disbursements	(729.65)	$ 612.89	$(1,342.54)
Cash in Bank and on Hand, January 1, 1968	15,947.70		
Cash in Bank and on Hand, December 31, 1968	$15,218.05		

Note 1: This adjustment is needed for cash basis purposes since payroll taxes and withholdings applicable to one year were paid in subsequent year.

* See TABLE IX

MILLER AND McCOLLOM
CERTIFIED PUBLIC ACCOUNTANTS

APPENDIX VIII

FORMS INVENTORY

Item	Frequency of Use*					
	d	w	m	a	v	s
1. Proposed Form for Book Orders		X				X
2. Supplies and Work Requisition Form (DPL)		X				
3. Deposit Order Blank Form (GPO)					X	
4. Request for Location Forms		X				
5. Request for Location of Title Form		X				
6. Monthly Record of Requests Circularized to Other Union Catalogs Form		X				
7. Address Label Forms	X					
8. Small Desk Note Form (Informal)					X	
9. Bib. Center Memorandum Form (lg. & sm.)					X	
10. Employee Time Sheet Form (Photocopy)	X					X
11. Annual Record Form for Pay Period Info.			X			X
12. Bib. Center Personnel Salary Record Form			SEMI M. X			X
13. Filing Time Sheet Form (Photocopy)	X					
14. Staff Time Spent Form					X	
15. Check Form for Bib. Center (Stub incl. - Photocopy)		X				X
16. TWX Supplies - Inventory Record Form (Photocopy)					X	
17. Travel Expense Summary (Photocopy) 1969					X	X
18. TWX Messages 1969 (Photocopy)			X			
19. Participating Stations - TWX Messages 1969(Photocopy)			X			
20. Bib. Center Petty Cash (Photocopy)			X			
21. Supporting Data for 1969 Payment to Bib. Center Form				X		X
22. Forms for Journal Entries for posting in accounts under specific headings			X			X
23. Forms for posting initial Ledger entries to record CASH DISBURSEMENTS and for recording allocations of amounts charged to the Colorado State Grant.			X			X

* d = daily; w = weekly; m = monthly; a = annually; v = variously; s = archived.

FORMS INVENTORY
(Continued)

Item	Frequency of Use					
	d	w	m	a	v	s
24. Forms for posting initial entries in Ledger to record CASH RECEIPTS			X			X
25. Standard Interlibrary Loan Request Via TWX (Standard Form) (ALA)	X					
26. Standard Form for Requesting Locations from Library of Congress - Experiment (DLC)	X					
27. Standard Form for Reporting Locs to the Colorado Systems	X					
28. Standard Form for Reporting Locations to Member Libraries Other than the Colorado Systems	X					
30. Telephone Request Record Form	X					
31. Work Slip Inserted into A.L.A. Interlibrary Loan Forms (Form)	X					
32. Interlibrary Loan Request (ALA)	X					
33. Form Returned with Part-5 of the A.L.A. Form to Indicate Additional Locations	X					
34. Instructions sent with return of Interlibrary Loan Request Forms (Photocopy)					X	
35. Report of Holdings for member libraries Form			X			
36. Instructions Sent With Return of Interlibrary Loan Request Forms (four types)					X	
37. TWX Message Record Used in Bib. Center and With TWX Installations in the Colorado Systems	X					
38. Annual Statistics By State				X		X
39. Annual Statistics by Type of Library				X		X
40. Daily Statistical Record of Interlibrary Loan Requests	X					
41. Monthly Statistical Reconciliation Forms: 33 Forms in Alphabetical Order by Member Library			X			
42. Receipt for Guide to Colorado Newspapers, 1859-1963					X	
43. Form Letter on Non-Supply of Bibliography					X	
44. Board of Trustees: Travel Expense Form					X	X
45. Bib. Center Staff: Travel Expense Form					X	X

FORMS INVENTORY
(Continued)

Item	Frequency of Use					
	d	w	m	a	v	s
46. Memo to Board for Obtaining Directory Information					X	
47. Kardex Card: Membership Record				X		X
48. Kardex Card: Record of Requests by Each Member by Month			X			X
49. Kardex Card: Statistical Record for Colorado System Libraries under State Agency Plan (2 cards)			X			X
50. Billing Form: Submitted Usually in Duplicate or According to Instruction from Member				X or quarterly		X
51. Membership Contract Letter					X	X
52. Kardex Card: Monthly Record of Cards Contributed to the Union Catalog by Each Member			X			
53. Memorandum to Member Library Re Contributions to Union Catalog					X	
54. Instructions for Submitting Cards, July 1968 (2 pages)					X	X
55. Weekly Roster of Cards Contributed to Union Catalog by Each Member Library		X				
56. Codes Most Used - Bibliographical Center's Union Catalog					X	X
57. Inventory Record Sheet	X					

APPENDIX IX

BIBLIOGRAPHICAL CENTER FOR RESEARCH
ROCKY MOUNTAIN REGION, INC.

FILES MAINTAINED
AS OF
JUNE 10, 1969

Files Maintained

1. Rolodex desk file - members, Board, committees.
2. Rolodex desk file - telephone numbers.
3. Kardex: membership payments and use statistics.
4. Kardex: card contribution statistics.
5. Addressograph - metal plates: members, Board, committees.
6. Addressograph - plastic "credit" cards for
   a. borrowing libraries
   b. lending libraries.
7. Card index: publications, promotional, mailing list.
8. Card index: Oehlerts bibl. purchasers.
9. Card catalog
   a. materials inventoried
   b. materials to be inventoried.
10. Inventory record/catalog work slips for "9-a".
11. Union catalog
    a. Pre-1956 imprints
       (1) permanent file
       (2) supplemental files (2)
       (3) preliminary file
    b. 1956 - 1965 imprints
       (1) permanent file (Ektriever)
       (2) supplemental file
       (3) preliminary file
    c. 1966+ imprints
       (1) permanent file
       (2) supplemental file
       (3) preliminary file
    d. Incoming receipts (1st sort according to "11-a, b & c").
12. Interlibrary loan requests
    a. current, to be logged and numbered
    b. current, unprocessed (all except Colorado systems)
       (1) filed by calendar date
           (a) serials
           (b) pre-1956 imprints
           (c) 1956+ imprints
       (2) rush requests
       (3) in process by staff
    c. current, unprocessed (Colorado systems)
       (1) filed alphabetically by calendar date only
    d. current, processed, to be completed, i.e. typed (all except the Colorado systems.
    e. current, processed, to be completed i.e., typed (Colorado Systems)
    f. current, processed, to be completed, i.e., Addressed (Colorado Systems)
    g. current, processed, to be sorted and mailed
    h. completed requests, file copy to be filed
    i. completed requests, current file,(2 mos. (all exc. Colorado Systems)
    j. completed requests, current file, 2 mos. (Colorado Systems)
    k. pre-circularization file (requests without regional locations)
    l. circularization file, current, in-process
    m. circularization file, completed, awaiting entry of locations into union catalog

Files Maintained (cont.)

12. Interlibrary Loan requests

    n. Bibliographical Center interlibrary loan request file
    o. storage files, interlibrary loan completed requests (3 years)
    p. card index file - lending libraries not in addressograph file
    q. card index file - Bibliographical Center members
    r. address labels - borrowing libraries
    s. forms file - interlibrary loan requests
    t. duplicate system request file, Colorado (for CSL)
    u. work slips, completed requests (partial file - kept one month only)
    v. daily statistical records
        (1) current month
        (2) current year
        (3) previous year (storage)
    w. Library of Congress experiment - TWX messages.

13. Correspondence and records
    a. current accounting records
    b. current operational records
        (1) Board minutes
        (2) Committee records
        (3) acquisition records, etc.
    c. storage as above in "a" and "b"
    d. inactive membership file
    e. old records (unorganized and in several files)
    f. publishers and sales catalogs
    g. VF - pamphlet-subject file (largely unorganized)
    h. SLA file
    i. special file on right-wing organizations
    j. old acquisition records.

BCR/PFH:lh

APPENDIX X

SIZE OF CARD CATALOG FILES

As of December 31, 1967		As of December 31, 1968	
Union (Accessible) File:	Storage:	Union (Accessible) File:	Storage:
PRE-1956	100,000 est.	PRE-1956	208,400
2,249,800		2,249,800	
Supp.		Supp.	
1,195,200 (est.)		608,410	
1956-1965	72,071	1956-1965	154,500
413,103		413,103	
Supp.		Supp.	
207,479		270,550	
1966+	45,800	1966+	98,400
84,000		84,000	
		Supp.	
		45,800	
TOTAL	217,871	TOTAL	461,300
4,149,582		3,671,663	
		GRAND TOTAL	4,132,993

Net Increases or Decreases		Union (Accessible) File Increases or Decreases	Storage File Increases
PRE-1956	-478,390 *	-586,790 *	108,400
1956-65	+145,500	+ 63,071	82,429
1966+	+ 98,400	+ 45,800	58,600
TOTAL	- 234,490 *	-477,919 *	243,429

* Net decreases reflect the weeding out of L.C. Depository Cards.

APPENDIX XI

BIBLIOGRAPHICAL CENTER FOR RESEARCH
ROCKY MOUNTAIN REGION, INC.

FURNITURE & FIXTURES INVENTORY
AS OF
JUNE 10, 1969

ITEM	DATE PURCHASED	PRICE
Shelving		
All shelving is the property of Denver Public Library		
Catalog Cases		
2 - 60 drawer birch units	10-5-65	$ 975.50
All other catalog cases presently in the Center are the property of the Center. For records on transaction involving old Denver Public Library cases, see attachments to memo dated 2-10-62 in these files.		
Files - Metal		
1 - 4 drawer locked file (Rogers)	3-16-62	60.90
1 - 4 drawer (Hon)	Not Known	Not Known
1 - 4 drawer (Invincible)	"	"
1 - 4 drawer (Hine)	"	"
1 - 3 drawer (Am.Metal Prod.)	"	"
3 - 10 drawer double catalog, card size (Yawman-Erbe)	"	"
Files - Wood		
1 - 4 drawer (Shaw Walker)	"	"
5 - 4 drawer (Library Bureau)	"	"
1 - 4 drawer (AFT Co.)	"	"
Desks		
1 oak desk (right-hand, deep drawer)	"	"
1 oak typewriter desk (left-hand)	"	"
2 oak typewriter desks (right-hand)	"	"
1 grey metal typewriter desk (left-hand)	"	"
1 small oak desk (used)	5-17-63	35.00
1 small oak desk (Centennial)	5-13-63	64.50
2 small grey wood desks (made by DPL carpenter)	Apr.'63	No Charge
4 small wood desks on loan from DPL		
Chairs		
1 executive chair	Not Known	Not Known
7 steno chairs	"	"
2 steno chairs (Cosco)	4-1-63	62.50
2 steno chairs (Cosco)	7-29-66	54.80
9 oak library chairs	Not Known	Not Known
1 oak steno chair	"	"
Tables		
1 large wood table	"	"
1 small oak table	"	"
2 oak tables on rollers	"	"
1 grey wood table on loan from DPL		
Small Stands		
1 metal table (Kardex)	11-30-64	83.00
1 wood typewriter stand	Not Known	Not Known
1 metal typewriter stand	"	"
1 metal typewriter stand, plastic top (Maso)	10-19-66	24.80
Typewriters		
1 Remington Electric (broken)	1-19-62	335.50
1 Royal Manual	10-24-66	256.50
1 Royal Manual	4-29-64	215.67
1 IBM Electric	1-31-68	525.00

ITEM	DATE PURCHASED	PRICE
Adding Machine		
1 Olivetti Underwood	5-2-67	$$ 442.80
Loktriever		
1 Loktriever II-X	1-17-68	7,012.95
Kardex		
1 Kardex unit	12-31-62	122.00
1 Kardex unit	1-5-65	129.50
Dictating Machine		
1 Norelco 81-R dictating machine (stolen from Bib.Center 2-1-63)	1-16-63	259.32
1 Norelco 81-R dictating machine (replacement)	3-6-63	263.82
Addressograph Equipment		
1 data recorder	4-29-68	95.55
1 data recorder	5-31-68	123.85
3 card files, base	5-7-68	47.40
3 card files	5-31-68	32.48
2 card files	5-22-69	22.04
Miscellaneous		
1 book truck		
1 metal stepladder		
1 bulletin board		
1 Bates numbering machine		
exhibit pegboard		
2 wood stools		
1 metal foot locker		
transfer files		
storage files		
1 electric clock		
desk files		
file baskets		
calendar pads		
12 waste baskets		
2 desk rolodex files		
1 paper cutter		
1 hole puncher		
1 postage scale		
Rented/Leased Equipment		
1 teletypewriter Model 33 ASR		
1 Pitney-Bowes postal metering machine		
1 Pitney-Bowes postal meter		
Added		
1 Royal portable typewriter owned by P. Hayes is on premises		

BCR/PFH:lh

APPENDIX XII

REQUESTS STATISTICS 1968

States

	Ariz.	Calif.	Colo.	Id.	Ia.	Kans.	Missouri	Neb.	Nev.	N.Mexico	N.Dak.	Okla.	S. Dak.	Tex.	Utah	Wyo.	Total
Jan.	56	1	950	3	2	35	5	77	25	26	11	0	120	86	115	116	1628
Feb.	31	0	988	5	2	42	10	34	25	76	10	0	181	104	101	95	1704
Mar.	53	0	932	1	1	266 **	2	62	39	39	13	0	181	65	165	184	2003
Apr.	33	0	856	3	0	65	4	23	30	31	10	10	150	77	172	127	1591
May	17	0	793	5	0	60	5	39	20	63	21	27	72	41	128	144	1435
Jun.	27	0	580	1	0	33	3	32	20	53	6	46	75	70	107	146	1199
Jul.	21	0	933	0	5	40	6	28	4	42	18	61	88	162	175	121	1704
Aug.	42	0	956	0	8	39	0	31	18	32	1	65	58	83	113	102	1548
Sept.	39	0	1109	0	18	41	0	30	12	25	10	49	116	45	154	89	1737
Oct.	28	0	1628	0	25	41	6	55	22	42	13	70	141	83	209	142	2505
Nov.	22	0	1290	0	24	46	6	77	17	29	23	78	203	83	165	88	2151
Dec.	20	0	972	0	29	37	1	49	16	34	26	46	143	39	105	144	1661
TOTAL Jan-Dec	389	1	11,987*	18	114	745	48	537	248	492	162	452	1528	938	1709		20,866

* 113 of these requests are actually from completely outside of the region. Therefore there were 11869 requests from libraries within Colorado. California, Idaho, and Iowa are considered to be outside of the Rocky Mountain Region.

** The Kansas Information Circuit Demonstration sent an estimated 200 unverified requests within a two-week period during March 1968.

STATISTICS 1968

MONTH	PUBLIC	COLL. & UNIV.	STATE	FEDERAL	SPECIAL LIB.	CoDB	IND.	TOTALS
JANUARY	569	790	210	13	39	7		1628
FEBRUARY	566	908	170	22	31	7		1704
MARCH	523	897	487	22	66	8		2003
APRIL	467	863	156	16	84	5		1591
MAY	581	632	161	9	44	8		1435
JUNE	395	581	184	9	25	5		1199
JULY	600	884	166	10	41	3		1704
AUGUST	752	563	166	16	46	5		1548
SEPTEMBER	805	668	207	13	43	1		1737
OCTOBER	1166	1038	234	20	37	10		2505
NOVEMBER	1028	776	291	8	39	9		2151
DECEMBER	935	512	170	12	17	15		1661
TOTAL	8387	9112	2602	170	512	83		20,866